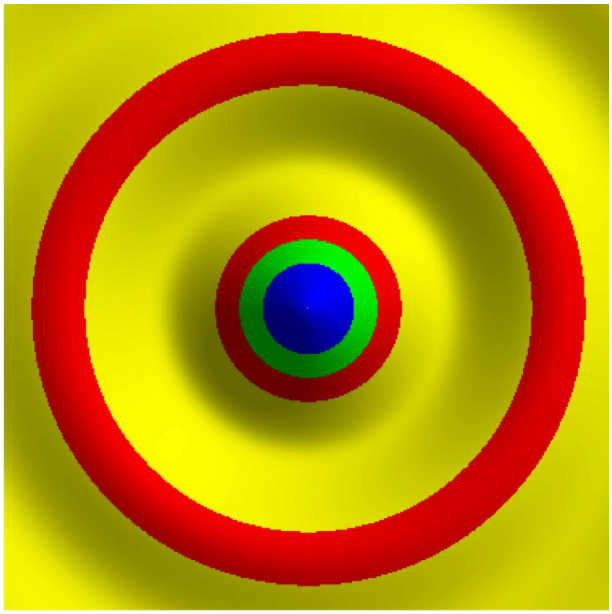
Quick Reference of eps-Toolkit 2.0 for Octave and MATLAB(R)



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Contents

Chapter 1

Introduction

This EPS-Toolkit is a solution of my big problem that I had 1997. I needed graphical output functions for programs which ran with Octave (a freeware Matlab-clone on Unix(Linux)-sytems) and Matlab. But I could not find any tool in the internet. So, I wrote this tool myself.
The toolkit consists of some matlab functions, which generate graphical outputs with postscript commands. To view and print the generated postscript files you can use Ghostscript or Ghostview (freeware for all systems).

Features

- MATLAB(R)-Code(4.3) with graphical output functions runs in Matlab and Octave
- All functions are pure m-files
- Most 2D scientific graphics functions are written
- Modifications and extensions are no problem
- Generated EPS-files are very small and importable with no loss of quality
- WYSIWYG (with Ghostview)
- Freeware (GPL)

Difference to version 1.9

- log scaled axes
- return long tic positions of axes
- new image functions e.g. ebright, econtra, eimgrot
- text functions etxtbox, etxtread, etxtlpos
- pie plot and error bars
- linear interpolation with elineip and efillmat
- frames, circles, ellipses
- ASCII85 bitmap code
- JPEG-file integration
- bugs removed in eopen, ehead, egridcl ...

Requirements

- Matlab $\geq 3.x$ or Octave $\geq 2.x$
- Ghostscript and Ghostview or other viewer for EPS-Files
- 1.2 MB space on disk

Installation

1. Include the epstk-directory in the octave-path or matlab-path
2. Edit file "einit.m" in epstk-directory to set the Parameter "ePath", "eGhostview" and "eGhostscript".

Testing

1. Start matlab or octave
2. Start demos edemo1, edemo2, ... edemo14

If all demos works, epstk should be ok.

Thanks

Thanks to Josef Worms, Jörg Heckenbach, Coletta Schumacher and Gerd Krämer.

Chapter 2

Global Parameters

2.1 The toolkit and the parameter

This toolkit needs global variables of MATLAB(R) or octave to get default values for the functions. All global parameter are defined in the file 'einit.m'. Which global parameter are used by a function you can see in the description of the functions after this chapter.

2.2 Handling of parameter

If you want to change any default values, edit the file 'einit.m'. This file is called by function 'eopen' everytime.

You can change a global parameter in a program temporarily, if you have called 'eglobpar' before. If you need the default values again after modifications of the global parameter, you should use the commands 'esavpar' and 'erespar'. 'esavpar' saves all global parameters and 'erespar' restores the last backup.

Please note: There are some parameter you can not change temporarily!
They are parameter like 'epsFileName' or 'pageOrientation', which initialize the plot-file, the page and the window with the function 'eopen'. In this case use the parameter of 'eopen'.

2.3 Default Values

Here are the default values of the toolkit (listing of 'einit.m'):

```
ePath='./';%default directory of epstk-mfiles
%ePath='/usr/share/octave/site/m/epstk/';%default directory of epstk-mfiles

%eGhostscript=''; %no ghostscript
eGhostscript='gs'; %ghostscript for linux
%eGhostscript='"c:/gs/gs7.04/bin/gswin32.exe"'; %ghostscript for windows

%eGhostview=''; %no ghostview
%eGhostview='gv -scale -2'; %gv for linux
eGhostview='ghostview -magstep -2'; %ghostview for linux
%eGhostview='"c:/gs/gsview/gsview/gsview32.exe"'; %ghostview for windows
```

```
eFileName='epstkout.eps';                % default eps-outputfile
eFile=0; %fileId of eFileName
eUserUnit='mm';                          % or 'cm' or 'inch' or 'inch/72'
if strcmp(eUserUnit,'mm'),eFac=2.834646;
elseif strcmp(eUserUnit,'cm'),eFac=28.34646;
elseif strcmp(eUserUnit,'inch'),eFac=72;
else eFac=1;
end


%fonts  (standard fonts of postscript)
eFonts=[
'Times-Roman             ';      % font number 1
'Times-Italic            ';      % font number 2
'Times-Bold              ';      % font number 3
'Times-BoldItalic        ';      % font number 4
'Helvetica               ';      % font number 5
'Helvetica-Oblique       ';      % font number 6
'Helvetica-Bold          ';      % font number 7
'Helvetica-BoldOblique   ';      % font number 8
'Courier                 ';      % font number 9
'Courier-Oblique         ';      % font number 10
'Courier-Bold            ';      % font number 11
'Courier-BoldOblique     ';      % font number 12
'Symbol                  '];     % font number 13

%colormaps
eColorMaps=[...
  %0 black->white                                get it with ecolors(0)
  0 0.0 0.0 0.0;0 1.0 1.0 1.0;

  %1 red->yellow                                 get it with ecolors(1)
  1 0.4 0.0 0.0;1 1.0 0.0 0.0;1 1.0 1.0 0.0;

  %2 violet->blue->yellow->red                   get it with ecolors(2)
  2 0.4 0.0 0.4;2 0.0 0.0 1.0;2 0.0 1.0 1.0;2 1.0 1.0 0.0;2 1.0 0.0 0.0;

  %3 blue->yellow->red                           get it with ecolors(3)
  3 0.0 0.0 0.4;3 0.0 0.0 1.0;3 0.0 1.0 1.0;3 1.0 1.0 0.0;3 1.0 0.0 0.0;

  %4 black->violet->blue->yellow->red            get it with ecolors(4)
  4 0.1 0.0 0.1;4 0.4 0.0 0.4;4 0.0 0.0 1.0;4 0.0 1.0 1.0;
  4 1.0 1.0 0.0;4 1.0 0.0 0.0;

  %5 green->yellow->red->violet                  get it with ecolors(5)
  5 0.0 0.4 0.0;5 0.0 1.0 0.0;5 1.0 1.0 0.0;5 1.0 1.0 0.0;
  5 1.0 0.0 0.0;5 0.5 0.0 0.2;

  %6 white->black->violet->blue->yellow->red   get it with ecolors(6)
  6 1.0 1.0 1.0;6 0.0 0.0 0.0;6 0.4 0.0 0.4;6 0.0 0.0 1.0;
  6 0.0 1.0 1.0;6 0.0 1.0 0.0;6 1.0 1.0 0.0;6 1.0 0.0 0.0;

  %7 grey->yellow->red                           get it with ecolors(7)
  7 1.0 1.0 0.9;7 1.0 1.0 0.0;7 1.0 0.0 0.0;
```

```
  %8 white->blue->grey->red->white             get it with ecolors(8)
  8 1.0 1.0 1.0;8 0.2 0.2 1.0;8 0.5 0.5 0.5;8 1.0 0.2 0.2;
  8 1.0 1.0 1.0;
];


% page
ePageWidth=210; % mm A3=297 A4=210 A5=148
ePageHeight=297;% mm A3=420 A4=297 A5=210
ePageOrientation=0; % 0=Portrait 1=Landscape 2=Upside-down 3=Seaside
ePageReflection=0; %  1=on 0=off  reflect page
eXScaleFac=1; % 1=no resize  0.5=50% reduce  2=200% enlarge
eYScaleFac=1; % 1=no resize  0.5=50% reduce  2=200% enlarge

% window
eWinWidth=180; % mm
eWinHeight=250; % mm
eWinFrameVisible=0; % 1=on 0=off   draw frame around window
eWinFrameLineWidth=0.3; % mm
eWinGridVisible=0; % 1=on 0=off   draw grid of window
eWinTimeStampVisible=0; % 1=on 0=off  print time stamp outside of frame
eWinTimeStampFont=1; % font number 1=TimesRoman select font of time stamp
eWinTimeStampFontSize=1.5; % mm

%plot area
ePlotAreaPos=[40 100]; % x y position of left bottom corner of plot area
ePlotAreaWidth=100; % mm
ePlotAreaHeight=100; % mm
ePlotAreaXValueStart=0; % value range of x-axis
ePlotAreaXValueEnd=100;
ePlotAreaYValueStart=0; % value range of y-axis
ePlotAreaYValueEnd= 100;
ePlotLineNo=0;

%polar plot area
ePolarPlotAreaCenterPos=[90 160]; % x y position of Center of polar plot area
ePolarPlotAreaRadMin=10; % mm
ePolarPlotAreaRadMax=50; % mm
ePolarPlotAreaAngStart=0; % deg, 0=east 90=north 180=west 270=south
ePolarPlotAreaAngEnd=360; % deg, 0=east 90=north 180=west 270=south
ePolarPlotAreaValStart=0; % value range of radius-axis
ePolarPlotAreaValEnd=100;
ePolarPlotLineNo=0;
ePieSliceNo=0;

% title obove plots
ePlotTitleDistance=20; % mm
ePlotTitleFontSize=6; % mm
ePlotTitleText=''; % text string
ePlotTitleTextFont=1; % font number   1=TimesRoman

% grid
eXGridLineWidth=0.1; % mm
```

```
eXGridColor=[0 0 0]; % [r g b]   [0 0 0]=black  [1 1 1]=white
eXGridDash=0.5; % mm    0=solid line >0=dash length
eXGridVisible=0; %
eYGridLineWidth=0.1; % mm
eYGridColor=[0 0 0]; % [r g b]   [0 0 0]=black  [1 1 1]=white
eYGridDash=0.5; % mm    0=solid line >0=dash length
eYGridVisible=0; % 0=off 1=on

% polar grid
ePolarRadiusGridLineWidth=0.1; % mm
ePolarRadiusGridColor=[0 0 0]; %  [r g b]   [0 0 0]=black  [1 1 1]=white
ePolarRadiusGridDash=1; % mm   0=solid line >0=dash length
ePolarRadiusGridVisible=1; %  0=off 1=on
ePolarAngleGridLineWidth=0.1; % mm
ePolarAngleGridColor=[0 0 0]; %   [r g b]   [0 0 0]=black  [1 1 1]=white
ePolarAngleGridDash=2; % mm   0=solid line >0=dash length
ePolarAngleGridVisible=1; %  0=off 1=on

% axes
eAxesColor=[0 0 0]; %   [r g b]   [0 0 0]=black  [1 1 1]=white
eAxesLineWidth=0.3; % mm
eAxesTicShortLength=1.5; % mm
eAxesTicLongLength=3; % mm
eAxesTicLongMaxN=9; % max. number of long Tics
eAxesValueSpace=1; % mm
eAxesValueFontSize=4; % mm
eAxesLabelFontSize=4; % mm
eAxesLabelTextFont=5; % font number   5=Helvetica
eAxesCrossOrigin=0; % 0=off 1=on 2=on and with arrows

% scale vectors:if start=0 and end=0 then autorange,if step=0 then autoscale
% south axis
eXAxisSouthScale=[0 0 0]; % [start step end]
eXAxisSouthScaleType=0; % 0=linear 1=classes 2=log10
eXAxisSouthValueFormat=-1; %  n digits after decimal point,-1=auto
eXAxisSouthValueVisible=1; %  0=off 1=on
eXAxisSouthValuePos=[0 0]; %  value positions after drawing of axis
eXAxisSouthLabelDistance=2; % mm  label distance from axis
eXAxisSouthLabelText='';
eXAxisSouthVisible=1; %  0=off 1=on

% north axis
eXAxisNorthScale=[0 0 0]; % [start step end]
eXAxisNorthScaleType=0; % 0=linear 1=classes 2=log10
eXAxisNorthValueFormat=-1;  %  n digits after decimal point,-1=auto
eXAxisNorthValueVisible=1;  %  0=off 1=on
eXAxisNorthValuePos=[0 0]; %  value positions after drawing of axis
eXAxisNorthLabelDistance=2;  % mm  label distance from axis
eXAxisNorthLabelText='';
eXAxisNorthVisible=1; %  0=off 1=on

% west axis
eYAxisWestScale=[0 0 0]; % [start step end]
eYAxisWestScaleType=0; % 0=linear 1=classes 2=log10
```

```
eYAxisWestValueFormat=-1;   %  n digits after decimal point,-1=auto
eYAxisWestValueVisible=1;   %  0=off 1=on
eYAxisWestValuePos=[0 0]; %  value positions after drawing of axis
eYAxisWestLabelDistance=6;   % mm  label distance from axis
eYAxisWestLabelText='';
eYAxisWestVisible=1; %  0=off 1=on

% east axis
eYAxisEastScale=[0 0 0]; % [start step end]
eYAxisEastScaleType=0; % 0=linear 1=classes 2=log10
eYAxisEastValueFormat=-1;  %  n digits after decimal point,-1=auto
eYAxisEastValueVisible=1;  %  0=off 1=on
eYAxisEastValuePos=[0 0]; %  value positions after drawing of axis
eYAxisEastLabelDistance=6;  % mm  label distance from axis
eYAxisEastLabelText='';
eYAxisEastVisible=1; %  0=off 1=on

%polar radius axis
ePolarAxisRadScale=[0 0 0]; % [start step end]
ePolarAxisRadScaleType=0; % 0=linear 1=classes 2=log10
ePolarAxisRadValueFormat=-1;  %  n digits after decimal point,-1=auto
ePolarAxisRadValueVisible=3;  %  0=off,1=RadStart on,2=RadEnd on,3=Start+End on
ePolarAxisRadValuePos=[0 0]; %  value positions after drawing of axis
ePolarAxisRadVisible=1; %  0=off,1=RadStart on,2=RadEnd on,3=Start+End on

%polar angle axis
ePolarAxisAngScale=[0 0 0]; % [start step end]
ePolarAxisAngValueFormat=-1;  %  n digits after decimal point,-1=auto
ePolarAxisAngValueVisible=1;  %  0=off 1=on
ePolarAxisAngValueAngle=0;  %  angle positions of values after drawing of axis
ePolarAxisAngVisible=1;  %  0=off 1=on

%plot line
ePlotLineColor=[0 0 0]; %   [r g b]   [0 0 0]=black  [1 1 1]=white
ePlotLineDash=0;  % mm 0=solid line,>0=dash length,<0=fill line,'abc'=symbol abc
ePlotLineWidth=0.3; % mm
ePlotLineInterpolation=0; % 0=off 1=on

%plot legend
ePlotLegendPos=[-15 -20];% position relativ to left bottom corner of plot area
ePlotLegendFontSize=4; % mm
ePlotLegendDistance=100; % in percent, depend on ePlotLegendFontSize
ePlotLegendTextFont=1;  % font number   1=TimesRoman

%image
eImageDefaultColorMap=0; % number of default map of eColorMaps
eImageFrameVisible=0; % 0=off 1=on

%image legend
eImageLegendPos=[0 -25]; % position relativ to left bottom corner of plot area
eImageLegendWidth=0; % mm 0=ePlotAreaWidth
eImageLegendHeight=5; % mm
eImageLegendScale=[0 0 0]; % [start step end]
eImageLegendScale=[0 0 0]; % [start step end]
```

```
eImageLegendScaleType=0; % 0=linear 1=classes 2=log10
eImageLegendValueFormat=-1; %  n digits after decimal point,-1=auto
eImageLegendValueVisible=1;  %  0=off 1=on
eImageLegendValuePos=[0 0];  %  value positions after drawing of axis
eImageLegendLabelDistance=2; % mm
eImageLegendLabelText='';
eImageLegendVisible=1; %  0=off 1=on

%parameter
eParamPos=[30 65];  % absolut position of window
eParamFontSize=4; % mm
eParamLineDistance=100; % in percent, depend on eParamFontSize
eParamTextValueDistance=100; % in percent, depend on eParamFontSize
eParamText='';
eParamTextFont=3;  % font number   1=TimesRoman
eParamValue='';
eParamValueFont=11;  % font number   9=Courier

%line
eLineWidth=0.3; % mm
eLineColor=[0 0 0]; %   [r g b]   [0 0 0]=black  [1 1 1]=white
eLineDash=0;  % mm   0=solid line   >0=dash length

%text
eTextFont=1;  % font number   1=TimesRoman
eTextFontSize=4; % mm
eTextPos=[30 eWinHeight-eTextFontSize]; % inital position is left top of window
eTextColor=[0 0 0]; %   [r g b]   [0 0 0]=black  [1 1 1]=white
eTextAlignment=1; % 1=right 0=center -1=left
eTextRotation=0; % in deg
eTextLimitWord=' '; % character to limit words
eTextLimitPara=setstr(10); % character  to limit paragraphs, setstr(10)=linefeed

%text box
eTextBoxFeedLine=0;  % mm 0=auto else fix linefeed
eTextBoxFeedPara=0;  % mm space between paragraphs
eTextBoxSpaceNorth=0;  % mm  space between text and the north border of box
eTextBoxSpaceSouth=0;  % mm  space between text and the south border of box
eTextBoxSpaceWest=0;  % mm  space between text and the north border of box
eTextBoxSpaceEast=0;  % mm  space between text and the south border of box

%contour
eContourLineWidth=0.2; % mm
eContourLineColor=[0 0 0]; %   [r g b]   [0 0 0]=black  [1 1 1]=white
eContourLineDash=0; % mm    0=solid line   >0=dash length
eContourScale=[0 0 0]; % [start step end]
eContourValueVisible=0;  %  0=off 1=on
eContourValueFormat=-1;  %  n digits after decimal point,-1=auto
eContourValueFont=5; % font number   5=Helvetica
eContourValueFontSize=2; % mm
eContourValueDistance=2+eContourLineWidth/2; % mm
eContourLevelsMaxN=10; % max. number of isolevels if autoscaling on

%table
```

```
eTabBackgroundColor=[-1 0 0]; %   [r g b] if r<0 then transparent
eTabFrameVisible=1;  %  0=off 1=on
eTabFrameLineWidth=eLineWidth; % mm
eTabFrameColor=[0 0 0]; %   [r g b]   [0 0 0]=black  [1 1 1]=white
eTabFrameDash=0; % mm    0=solid line   >0=dash length
eTabXLineVisible=1;  %  0=off 1=on
eTabXLineWidth=eLineWidth; % mm
eTabXLineColor=[0 0 0]; %   [r g b]   [0 0 0]=black  [1 1 1]=white
eTabXLineDash=0; % mm    0=solid line   >0=dash length
eTabYLineVisible=1;  %  0=off 1=on
eTabYLineWidth=eLineWidth; % mm
eTabYLineColor=[0 0 0]; %   [r g b]   [0 0 0]=black  [1 1 1]=white
eTabYLineDash=0; % mm    0=solid line   >0=dash length
```

Chapter 3

User Functions

3.1 Basic Functions

3.1.1 ebitmap.m

```
NAME
  ebitmap  -  transform  the current eps-file to bitmap-file

SYNOPSIS
  mapFileName=ebitmap([bitmapType[,resolution[,mapFileName[,epsFileName]]]])

PARAMETER(S)
  bitmapType     bitmap-type
                 default: 0
                 0 = PNG -format
                 1 = JPEG-format
                 2 = TIFF-format
                 3 = PPM-format
                 4 = PCX-format
  resolution     in dpi,resolution of bitmap-file
                 if scalar then resolution x and y direction are equal
                 default: 200  (dpi)
                 if [x y] vector then  resolution of x and y direction
                 if [x y q] vector then resolution and qualitiy of JPEG
                     q=100 for no lost of qualitiy
                     q=75  standard compression
  mapFileName    name of bitmap-file
                 default: 'eFileName.typeSuffix'
  epsFileName    name of eps-file
                 default: 'eFileName'
GLOBAL PARAMETER(S)
  eFileName
  eGhostscript
```

3.1.2 eclose.m

```
NAME
  eclose - finish plot(s) and close EPS-file
```

```
SYNOPSIS
  eclose ([nCopies[,message]])

PARAMETER(S)
  nCopies     number of hardcopies, for printing 1 or more copies
              default: nCopies=1, print one copy of current page
              if nCopies=0 then 'showpage' will not append
  message     switch for 'file written' message
              if message=1 then write message (default)
              else no message

GLOBAL PARAMETER(S)
  eWinFrameVisible
  eWinTimeStampVisible
```

3.1.3 eopen.m

```
NAME
  eopen  - open EPS-file, define size of page, size of window and
           call 'einit' to initialize the global parameter

SYNOPSIS
  eopen([ epsFileName[,pageOrientation[,winWidth,winHeight
        [,winShift[,xScaleFac,yScaleFac[,pageWidth,pageHeight
        [,pageReflection]]]]]]])

PARAMETER(S)
  epsFileName       name of eps-file (default name is defined as eFileName)
  pageOrientation   page orientation,
                    0=portrait 1=landscape 2=upside-down 3=seaside
  winWidth          width of window(=eps bounding-box)
  winHeight         height of window(=eps bounding-box)
  winShift          shift-vector of window, [xOffset yOffset]
                    ,shift of window center on page,
                    default vector is [0 0]=middle of page
  xScaleFac         scale factor 1= no resize
  yScaleFac         scale factor 1= no resize
  pageWidth         width of page
  pageHeight        height of page
  pageReflection    refection 1=on 0=off

GLOBAL PARAMETER(S)
  eFileName
  ePageWidth
  ePageHeight
  ePageScaleFac
  ePageOrientation
  ePageReflection
  eUserUnit
  eWinWidth
  eWinHeight
  eFonts
```

3.1.4 eview.m

```
NAME
  eview  -  start ghostview to show eps-file

SYNOPSIS
  eview([epsFileName])

PARAMETER(S)
  epsFileName    name of eps-file
                 default: string of global parameter 'eFileName'
GLOBAL PARAMETER(S)
  eFileName
```

3.2 Axes Functions

3.2.1 eaxes.m

```
NAME
  eaxes - draw scaled axes around plot area

SYNOPSIS
  eaxes ([xAxisSouthScale,yAxisWestScale[,xAxisNorthScale,yAxisEastScale]])

PARAMETER(S)
  xAxisSouthScale   scale vector of south axis [start step end]
  yAxisWestScale    scale vector of west axis  [start step end]
  xAxisNorthScale   scale vector of north axis [start step end]
  yAxisEastScale    scale vector of east axis  [start step end]

    special cases of scale vectors are:
      if start=0 and end=0 then autorange=on
      if step=0 then autoscale=on
    (default scale vector=[0 0 0])

GLOBAL PARAMETER(S)
  ePlotAreaXValueStart
  ePlotAreaXValueEnd
  ePlotAreaYValueStart
  ePlotAreaYValueEnd
  ePlotAreaPos
  ePlotAreaWidth
  ePlotAreaHeight
  eAxesValueFontSize
  eAxesValueSpace
  eAxesColor
  eAxesLineWidth
  eAxesTicShortLength
  eAxesTicLongLength
  eAxesTicLongMaxN
  eAxesCrossOrigin
  eAxesValueSpace
  eAxesLabelFontSize
```

```
  eAxesLabelTextFont
  eXAxis(South|West|East|North)Scale
  eXAxis(South|West|East|North)ScaleType
  eXAxis(South|West|East|North)Visible
  eXAxis(South|West|East|North)ValueFormat
  eXAxis(South|West|East|North)ValueVisible
  eXAxis(South|West|East|North)LabelText
  eXAxis(South|West|East|North)LabelDistance
```

3.2.2 eaxespol.m

```
NAME
  eaxespol - draw scaled axes and arc around polar plot area

SYNOPSIS
  eaxespol([axisRadiusScale,axisAngleScale])

PARAMETER(S)
  axisRadiusScale   scale vector of radius axis  [start step end]
  axisAngleScale    scale vector of angle circle [start step end]

    special cases of scale vectors are:
      if start=0 and end=0 then autorange=on
      if step=0 then autoscale=on

GLOBAL PARAMETER(S)
  ePolarPlotAreaCenterPos
  ePolarPlotAreaRadMin
  ePolarPlotAreaRadMax
  ePolarPlotAreaAngStart
  ePolarPlotAreaAngEnd
  ePolarPlotAreaValStart
  ePolarPlotAreaValEnd
  ePolarAxisRadScale
  ePolarAxisRadVisible
  ePolarAxisRadValueFormat
  ePolarAxisRadValueVisible
  ePolarAxisRadPos
  ePolarAxisAngScale
  ePolarAxisAngVisible
  ePolarAxisAngValueFormat
  ePolarAxisAngValueVisible
  ePolarAxisAngValueAngle
  eAxesValueFontSize
  eAxesColor
  eAxesLineWidth
  eAxesTicShortLength
  eAxesTicLongLength
  eAxesTicLongMaxN
  eAxesValueSpace
```

3.2.3 eaxis.m

```
NAME
  eaxis - draw scaled axis

SYNOPSIS
  eaxis(xPos,yPos,length,type,scale[,angle[,color[,offset]]])

PARAMETER(S)
  xPos         x-value of start position of axis
  yPos         y-value of start position of axis
  length       length  of axis
  type       orientation of scaling  'w'=west, 'e'=east, 's'=south, 'n'=north
  scale      vector of scaling, [startValue stepValue endValue]
  angle      angle to rotate axis
  color      color of axis
  offset     offset of position

GLOBAL PARAMETER(S)
  eAxesColor
  eAxesValueFontSize
  eAxesValueSpace
  eAxesLineWidth
  eAxesTicShortLength
  eAxesTicLongLength
  eAxesTicLongMaxN
  eXAxisSouthValueFormat
  eYAxisWestValueFormat
  eXAxisNorthValueFormat
  eYAxisEastValueFormat
  eXAxisSouthValueVisible
  eYAxisWestValueVisible
  eXAxisNorthValueVisible
  eYAxisEastValueVisible
  eXAxisSouthValuePos
  eYAxisWestValuePos
  eXAxisNorthValuePos
  eYAxisEastValuePos
  eXAxisSouthScaleType
  eYAxisWestScaleType
  eXAxisNorthScaleType
  eYAxisEastScaleType
```

3.3 Grid Functions

3.3.1 egrid.m

```
NAME
  egrid - draw grid

SYNOPSIS
  egrid([xAxisSouthScale,yAxisWestScale[,xAxisNorthScale,yAxisEastScale]])
```

```
PARAMETER(S)
  xAxisSouthScale   scale vector of south axis [start step end]
  yAxisWestScale    scale vector of west axis  [start step end]
  xAxisNorthScale   scale vector of north axis [start step end]
  yAxisEastScale    scale vector of east axis  [start step end]

    special cases of scale vectors are:
      if start=0 and end=0 then autorange=on
      if step=0 then autoscale=on
    (default scale vector=[0 0 0])

GLOBAL PARAMETER(S)
  ePlotAreaPos
  ePlotAreaWidth
  ePlotAreaHeight
  eAxesTicLongMaxN
  eXAxisSouthScale
  eXAxisSouthScaleType
  eYAxisWestScale
  eYAxisWestScaleType
  eXAxisNorthScale
  eYAxisEastScale
  eXGridVisible
  eYGridVisible
  eXGridLineWidth
  eXGridColor
  eXGridDash
```

3.3.2 egridpol.m

```
NAME
  egridpol - draw polar grid

SYNOPSIS
  egridpol ([axisRadiusScale,axisAngleScale])

PARAMETER(S)
  axisRadiusScale   scale vector of radius axis  [start step end]
  axisAngleScale    scale vector of angle circle [start step end]

    special cases of scale vectors are:
      if start=0 and end=0 then autorange=on
      if step=0 then autoscale=on

GLOBAL PARAMETER(S)
  ePolarPlotAreaValStart
  ePolarPlotAreaValEnd
  ePolarPlotAreaCenterPos
  ePolarPlotAreaRadMin
  ePolarPlotAreaRadMax
  ePolarPlotAreaAngStart
  ePolarPlotAreaAngEnd
```

```
  ePolarAxisRadScale
  ePolarAxisAngScale
  ePolarRadiusGridVisible
  ePolarRadiusGridLineWidth
  ePolarRadiusGridColor
  ePolarRadiusGridDash
  ePolarAngleGridVisible
  ePolarAngleGridLineWidth
  ePolarAngleGridColor
  ePolarAngleGridDash
  eAxesTicLongMaxN
```

3.4 Plot Functions

3.4.1 ebar.m

```
NAME
  ebar - get coordinates for bar-plotting

SYNOPSIS
  [xb yb]=ebar(y[,barWidth[,barNumber,clusterSize,[,x]])

PARAMETER(S)

  y            vector of y-data
  barWidth     x-size of bars
               if barWidth=0 then autosize
               default: barWidth=0
  number       number whithin the cluster
  clusterSize  total number of bars in one cluster
  x            vector of x-data

  xb           vector of x-coodinates
  yb           vector of y-coodinates
```

3.4.2 econtour.m

```
NAME
  econtour - draw a contour plot of matrix

SYNOPSIS
  econtour(matrix[,scale[,dash[,colorMap]]])

PARAMETER(S)
  matrix     matrix for contour plot
  scale      vector of scaling [start step end]
  dash       if dash=0 then draw solid lines
             else value of dash is the distance of dashs
  colorMap   colors for different iso-lines
```

```
GLOBAL PARAMETER(S)
  ePlotAreaWidth
  ePlotAreaHeight
  ePlotAreaPos
  eContourLineColor
  eContourLineDash
  eContourScale
  eContourLevelsMaxN
  eContourValueFormat
  eContourLineWidth
  eContourValueVisible
  eContourValueDistance
  eContourValueFont
  eContourValueFontSize
  eYAxisWestScale
  eXAxisSouthScale

    valueForm=sprintf('1.%df',vForm);
```

3.4.3 eerrbar.m

```
NAME
  eerrbar - get coordinates-matrix for errorbar-plotting

SYNOPSIS
  [xeb yeb]=eerrbar(x,y,error[,barWidth])

PARAMETER(S)

  x            vector of x-data
  y            vector of y-data
  barWidth     x-size of bars
               default: autosize

  xeb          matrix of x errorbar-coodinates
  yeb          matrix of y errorbar-coodinates
```

3.4.4 epie.m

```
NAME
  epie - draw a pie chart

SYNOPSIS
  angles=epie([value[,valueText[,legendText[,dash[,offset[,color]]]]]])

PARAMETER(S)
  value          value of pie slide
  valueText      text of value , if empty  string then no text at pie slice
  legendText     text of legend, if empty  string then no legend
  dash           border type,0=solid line,>0=dash length,
                 <0=fill slice with color
  offset         radial offset of pieslice, default=0
```

```
  color          color of pie, vector [r g b]
  angles         n x 2 matrix of pie slice angles, if epie without parameter
                 [pieSlice1StartAngle pieSlice1SizeAngle;
                  pieSlice2StartAngle ...

GLOBAL PARAMETER(S)
  ePolarPlotAreaCenterPos
  ePolarPlotAreaRadMax
  ePolarPlotAreaValStart
  ePolarPlotAreaValEnd
  ePolarPlotAreaAngStart;
  ePolarPlotAreaAngEnd
  ePolarPlotAreaRadMax
  ePolarPlotAreaRadMin
  ePlotLegendTextFont
  ePlotLegendFontSize
  ePlotLineDash;
  ePlotLineDash;
  eAxesTicLongLength
  eAxesValueSpace
  eAxesValueFontSize
  eAxesLineWidth
  eAxesColor
  ePolarAxisRadScale
  ePolarAxisAngScale
```

3.4.5 eplot.m

```
NAME
  eplot  - make linear plot

SYNOPSIS
  eplot ([xData,[yData,[legendText,[dash,[color[,width]]]]]])

PARAMETER(S)
  xData          vector of x-data
                 or matrix(2xn) of x0,x1-data to plot lines
  yData          vector of y-data
                 or matrix(2xn) of y0,y1-data to plot lines
  legendText     text of legend, if empty  string then no legend
  dash          if a scalar
                  =0  solid plot line,
                  >0  dash length
                  <0  fill plot line with color
                default: dash=eLineDash
                if a string then dash is a name of symbol
                if a matrix and color=-1
                  dash is the image of plot
                  and filled with RGB values
                  value=R*2^16+G*2^8+B) and R,G,B are integer of 0:255
                if a matrix and color is a colormap
                  dash is the image of plot
```

```
                  and filled with indices of colormap
                if a string dash is filename of a JPEG-file
  color         if dash>=0 vector of plot color ([r g b])
                if dash<0  vector of background color
                if dash a matrix then colormap of image or -1
                default: dash=eLineColor
  width         width of plot line

 Important: eplot without parameters closes the current plot explicit.
            it's useful for several plot on one page

GLOBAL PARAMETER(S)
  ePlotAreaPos
  ePlotAreaWidth
  ePlotAreaHeight
  eXAxisSouthScale
  eYAxisWestScale
  ePlotAreaXValueStart
  ePlotAreaXValueEnd
  ePlotAreaYValueStart
  ePlotAreaYValueEnd
  ePlotLineInterpolation
  ePlotLineWidth
  ePlotLineColor;
  ePlotLineDash;
  ePlotLegendPos;
  ePlotLegendTextFont
  ePlotLegendFontSize
  ePlotLegendDistance
  eAxesColor
```

3.4.6 epolar.m

```
NAME
  epolar - make polar plot

SYNOPSIS
  epolar ([xData,[yData,[legendText,[dash,[color[,width]]]]]])

PARAMETER(S)
  xData          vector of x-data
  yData          vector of y-data
  legendText     text of legend, if empty  string then no legend
  dash           0=solid line,>0=dash length,
                 <0=fill line,string=name of symbol
  color          color of plot, vetcor [r g b]
  width          width of plot

GLOBAL PARAMETER(S)
  ePolarAxisRadScale
  ePolarAxisAngScale
  ePolarPlotAreaCenterPos
  ePolarPlotAreaRadMax
```

```
  ePolarPlotAreaValStart
  ePolarPlotAreaValEnd
  ePolarPlotAreaAngStart;
  ePolarPlotAreaAngEnd
  ePolarPlotAreaRadMax
  ePolarPlotAreaRadMin
  ePlotLegendPos
  ePlotLegendTextFont
  ePlotLegendFontSize
  ePlotLegendDistance;
  ePlotLineWidth
  ePlotLineColor;
  ePlotLineDash;
  eAxesColor;
```

3.4.7 epolari.m

```
NAME
  epolari  - draw polar image of a matrix

SYNOPSIS
  epolari(matrix[,colorMap])

PARAMETER(S)
  matrix     matrix for image
             if colorMap=-1 then
                image is filled with RGB values
                value=R*2^16+G*2^8+B) and R,G,B are integer of 0:255
              else
                matrix is filled with indices of colormap
  colorMap   define own colormap
             default:colorMap=ecolors(eImageDefaultColorMap)

GLOBAL PARAMETER(S)
  eImageDefaultColorMap
  ePolarPlotAreaCenterPos
  ePolarPlotAreaRadMax
  ePolarPlotAreaAngEnd
  ePolarPlotAreaAngStart
  ePolarPlotAreaRadMin
  ePolarPlotAreaRadMax
```

3.5 Images Functions

3.5.1 ebright.m

```
NAME
  ebright  - change brightness of colormap

SYNOPSIS
  newColormap=ebright(colormap,brightness[,colorChannel])
```

```
PARAMETER(S)
  colormap      color table
  brightness    +/- brigthness in per cent
  newColormap   changed color table
  colorChannel  vector of Channel; 1=red, 2=green, 3=blue
                e.g. [1 3] = Channel red and blue
                default=[1 2 3]
```

3.5.2 econtra.m

```
NAME
  econtra  - change contra of colormap

SYNOPSIS
  newColormap=econtra(colormap,contrast[,colorChannel])

PARAMETER(S)
  colormap      color table
  contrast      -200 to 200 per cent
  newColormap   changed color table
  colorChannel  vector of Channel; 1=red, 2=green, 3=blue
                e.g. [1 3] = Channel red and blue
                default=[1 2 3]
```

3.5.3 eidx2rgb.m

```
NAME
  eidx2rgb  - covert  index-matrix to RGB-matrix

SYNOPSIS
  matrix=eidx2rgb(image,colormap)

PARAMETER(S)
  image       index-matrix
  colormap    color table
  matrix      RBG-matrix
```

3.5.4 eimage.m

```
NAME
  eimage  - draw image of a matrix

SYNOPSIS
  eimage(matrix[,colorMap])

PARAMETER(S)
  matrix     rows x cols matrix for image
```

```
               if colorMap=-1 then
                  image is filled with RGB values
                  value=R*2^16+G*2^8+B) and R,G,B are integer of 0:255
                else
                  matrix is filled with indices of colormap
             or a string of filename of a JPEG-file
  colorMap   define own colormap
             default:colorMap=ecolors(eImageDefaultColorMap)

GLOBAL PARAMETER(S)
  eImageDefaultColorMap
  ePlotAreaPos
  ePlotAreaWidth
  ePlotAreaHeight
  eImageFrameVisible
  eAxesLineWidth
```

3.5.5 eimagesc.m

```
NAME
  eimagesc  - draw scaled image of a matrix

SYNOPSIS
  x=eimagesc(matrix[,colorMap[,legendOrientation[,legendScale]]])

PARAMETER(S)
  x                 transformed output matrix with values of color numbers
  matrix            matrix for image
  colorMap          define own colormap
  legendOrientation side of the image where the legend appears
                    character 's'(south),'n'(north),'w'(west) or 'e'(east)
                    (default orientation is south)
  legendScale       scale vector of legend [start step end]
                    special cases of scale vector are:
                    if start=0 and end=0 then autorange=on
                    if step=0 then autoscale=on
                    (default scale vector=[0 0 0])

GLOBAL PARAMETER(S)
  ePlotAreaPos
  ePlotAreaWidth
  ePlotAreaHeight
  eImageDefaultColorMap
  eImageLegendScale
  eYAxisWestScale
  eXAxisSouthScale
```

3.5.6 eimgread.m

```
NAME
  eimgread  - read image-file
```

```
SYNOPSIS
  [image,colormap]=eimgread(imageFileName)

PARAMETER(S)
  imageFileName  name of JPEG- or PPM-file
  image          image matrix
                 if colormap used then
                   image is filled with indices of colormap
                 else
                   image is filled with RGB values
                   value=R*2^16+G*2^8+B) and R,G,B are integer of 0:255
                   that's a very fast way
  colormap       color table
```

3.5.7 eimgrot.m

```
NAME
  eimgrot  - rotate image

SYNOPSIS
  matrix=eimgrot(image,rotation)

PARAMETER(S)
  image       index-matrix
  rotation    rotation in deg, 90 180 or 270
  matrix      RBG-matrix
```

3.5.8 eimgview.m

```
NAME
  eimgview  - create and view eps-file of an image

SYNOPSIS
  eimgview(matrix[,colorMap[,epsFileName]])

PARAMETER(S)
  matrix      matrix for image
              if colorMap=-1 then
                matrix is filled with RGB values
                value=R*2^16+G*2^8+B) and R,G,B are integer of 0:255
              else
                matrix is filled with indices of colorMap
              or a string of filename of a JPEG-file
  colorMap    own colormap
              default:colorMap=ecolors(eImageDefaultColorMap)
  epsFileName default=eFileName
```

3.5.9 eimgwrit.m

```
NAME
  eimgwrit  - write image-file

SYNOPSIS
  eimgwrit(imageFileName,image,colormap,quality)

PARAMETER(S)
  imageFileName  name of image-file
                 possible are: png,jpg,tif,ppm,pcx
  image          matrix for image
                 if colormap=-1 then
                   image is filled with RGB values
                   value=R*2^16+G*2^8+B) and R,G,B are integer of 0:255
                 else
                   matrix is filled with indices of colormap
  colormap       color table
  quality        quality of JPEG-files, default=75  (%)
```

3.5.10 ejpgread.m

```
NAME
  ejpgread  - read JPEG-file

SYNOPSIS
  [image,head]=ejpgread(jpgFileName)

PARAMETER(S)
  imageFileName  name of JPEG-file e.g. 'photo.jpg'
  image       whole JPEG-file in a vector of uchar
  head        1 x 4 vector, [sizeOfJpegFile rowsOfImage colsOfImage rgb]
              rgb=1 if color image, rgb=0 if black and white image
```

3.5.11 epolaris.m

```
NAME
  epolaris  - draw scaled polar image of a matrix

SYNOPSIS
  x=epolaris(matrix[,colorMap[,legendOrientation[,legendScale]]])

PARAMETER(S)
  x                 transformed output matrix with values of color numbers
  matrix            matrix for image
  colorMap          define own colormap
  legendOrientation  side of the image where the legend appears
                    character 's'(south),'n'(north),'w'(west) or 'e'(east)
                    (default orientation is south)
  legendScale       scale vector of legend [start step end]
```

```
                    special cases of scale vector are:
                    if start=0 and end=0 then autorange=on
                    if step=0 then autoscale=on
                    (default scale vector=[0 0 0])

GLOBAL PARAMETER(S)
  eImageDefaultColorMap
  eImageLegendScale
  ePolarAxisRadScale
  ePolarAxisAngScale
  ePolarPlotAreaCenterPos
  ePolarPlotAreaAngStart
  ePolarPlotAreaAngEnd
  ePolarPlotAreaRadMax
```

3.5.12 ergb2idx.m

```
NAME
  ergb2idx  - covert RGB-matrix to index-matrix

SYNOPSIS
  [image,colormap]=ergb2idx(matrix)

PARAMETER(S)
  matrix      RBG-matrix
  image       index-matrix
  colormap    color table
```

3.5.13 eshadoi.m

```
NAME
  eshadoi  - draw shadow image of a matrix

SYNOPSIS
  [x,colorMapNew]=eshadoi(matrix[,colorMap])

PARAMETER(S)
  matrix             matrix for image
                     each value of the matrix is a row index of the colormap
  colorMap           define own colormap

  if the next return parameters are used then no output
  x                  shadow image matrix
  colorMapNew        colormap of x

GLOBAL PARAMETER(S)
  eImageDefaultColorMap
```

3.5.14 eshadois.m

```
NAME
  eshadois - draw scaled shadow image of a matrix

SYNOPSIS
  [x colorMapNew]=eshadois(matrix[,colorMap[,legendOrientation[,legendScale]]])

PARAMETER(S)
  matrix             matrix for image
  colorMap           define own colormap
  legendOrientation  side of the image where the legend appears
                     character 's'(south),'n'(north),'w'(west) or 'e'(east)
                     (default orientation is east)
  legendScale        scale vector of legend [start step end]
                     special cases of scale vector are:
                     if start=0 and end=0 then autorange=on
                     if step=0 then autoscale=on
                     (default scale vector=[0 0 0])

  if the next return parameters are used then no output
  x                  scaled shadow image matrix
  colorMapNew        colormap of x

GLOBAL PARAMETER(S)
  ePlotAreaPos
  ePlotAreaWidth
  ePlotAreaHeight
  eImageDefaultColorMap
  eImageLegendScale
  eYAxisWestScale
  eXAxisSouthScale
```

3.5.15 eshadoix.m

```
NAME
  eshadoix  - mix a shadow image with a cover image

SYNOPSIS
  [x colorMapNew]=eshadoix(matrix,coverImg,colorMap)

PARAMETER(S)
  matrix             matrix to calculate the shadow image
  coverImg           matrix for cover image
                     each value of this matrix is a row index of the colormap
  colorMap           colormap of coverImg

  if the next return parameters are used then no output
  x                  mix shadow image matrix
  colorMapNew        colormap of x
```

3.6 Line Functions

3.6.1 eellipse.m

```
NAME
  eellipse  - draw ellipse

SYNOPSIS
  eellipse(xPos,yPos,width,height[,lineWidth[,dash[,color
        [,rotation]]]])

PARAMETER(S)
  xPos          x-Position of center of ellipse
  yPos          y-Position of center of ellipse
  width         width of ellipse
  height        height of ellipse
  lineWidth     linewidth of ellipse
                default: lineWidth=eLineWidth
  dash          if a scalar
                  =0  solid ellipse,
                  >0  dash length
                  <0  fill ellipse with color
                default: dash=eLineDash
                if a matrix and color=-1
                  dash is the image of ellipse
                  and filled with RGB values
                  value=R*2^16+G*2^8+B) and R,G,B are integer of 0:255
                if a matrix and color is a colormap
                  dash is the image of ellipse
                  and filled with indices of colormap
                if a string dash is filename of a JPEG-file
  color         if dash>=0 vector of ellipse color ([r g b])
                if dash<0  vector of background color
                if dash a matrix then colormap of image or -1
                default: dash=eLineColor
  rotation      rotation of ellipse (in deg)

GLOBAL PARAMETER(S)
  eLineWidth
  eLineDash
  eLineColor
```

3.6.2 eframe.m

```
NAME
  eframe  - draw frame

SYNOPSIS
  eframe(xPos,yPos,width,height[,lineWidth[,dash[,color
        [,rotation[,cornerRadius]]]]])

PARAMETER(S)
  xPos          x-Position of sw-corner of frame
```

```
  yPos          y-Position of sw-corner of frame
  width         width of frame
  height        height of frame
  lineWidth     linewidth of frame
                default: lineWidth=eLineWidth
  dash          if a scalar
                  =0  solid frame,
                  >0  dash length
                  <0  fill frame with color
                default: dash=eLineDash
                if a matrix and color=-1
                  dash is the image of frame
                  and filled with RGB values
                  value=R*2^16+G*2^8+B) and R,G,B are integer of 0:255
                if a matrix and color is a colormap
                  dash is the image of frame
                  and filled with indices of colormap
                if a string then dash is filename of a JPEG-file
  color         if dash>=0 vector of frame color ([r g b])
                if dash<0  vector of background color
                if dash a matrix then colormap of image or -1
                default: dash=eLineColor
  rotation      rotation of frame (in deg)
  cornerRadius  radius of rounded corner
                default: 0=no rounded corner

GLOBAL PARAMETER(S)
  eLineWidth
  eLineDash
  eLineColor
```

3.6.3 elines.m

```
NAME
  elines  - draw lines

SYNOPSIS
  elines(xData,yData[,lineWidth[,dash[,color]]])

PARAMETER(S)
  xData       matrix(2xn) of x0,x1-data of lines
  yData       matrix(2xn) of y0,y1-data of lines
  lineWidth   width of lines
              default: lineWidth=eLineWidth
  dash        if dash=0 then draw solid lines
              else value of dash is the distance of dashes
              default: dash=eLineDash
  color       vector of line color ([r g b])
              default: color=eLineColor

GLOBAL PARAMETER(S)
  eLineWidth
  eLineDash
```

```
  eLineColor
```

3.6.4 epline.m

```
NAME
  epline  - draw polyline

SYNOPSIS
  epline(xData,yData[,lineWidth[,dash[,color]]])

PARAMETER(S)
  xData       vector of x-values of polyline
  yData       vector of y-values of polyline
  lineWidth   width of polyline
              default: lineWidth=eLineWidth
  dash          if a scalar
                  =0  solid lines,
                  >0  dash length
                  <0  fill polylines with color
                default: dash=eLineDash
                if a matrix and color=-1
                  dash is the image of polyline
                  and filled with RGB values
                  value=R*2^16+G*2^8+B) and R,G,B are integer of 0:255
                if a matrix and color is a colormap
                  dash is the image of polyline
                  and filled with indices of colormap
  color         if dash>=0 vector of frame color ([r g b])
                if dash<0  vector of background color
                if dash a matrix then colormap of image or -1
                default: dash=eLineColor

GLOBAL PARAMETER(S)
  eLineColor
  eLineDash
  eLineWidth
```

3.7 Text Functions

3.7.1 eparam.m

```
NAME
  eparam  -  print parameter text in two columns under plots

SYNOPSIS
  eparam(text1,text2[,x,y])

PARAMETER(S)
  text1        text of the left column
  text2        text of the right column
  x            x-coordinate of start position
```

```
  y            y-coordinate of start position

GLOBAL PARAMETER(S)
  eParamPos
  eParamFontSize
  eParamTextValueDistance
  eParamTextFont
  eParamValueFont
  eParamLineDistance
```

3.7.2 etext.m

```
NAME
  etext  -  write text

SYNOPSIS
  etext(text[,x[,y[,fontSize[,alignment[,font[,rotation[,color]]]]]]])

PARAMETER(S)
  text          text string
  x             x of start position
                if x=0 then the text starts after
                the last text in the same line
  y             y of start position
                if x=0 then y is a relativ position to the current line
  fontSize      scalar size of current font
                or vector [xSize ySize obliqueAngle(in deg)] of current font
  alignment     1=right 0=center -1=left from x-positon, y = line position
                2=right 3=center 4=left from x-positon, y = height of text/2
  font          font number (definition in einit.m)
  rotation      rotation of text (in deg)
  color         color of text, [r g b] vector

GLOBAL PARAMETER(S)
  eTextColor
  eTextRotation
  eTextFont
  eTextAlignment
  eTextFontSize
```

3.7.3 etxtbox.m

```
NAME
  etxtbox  -  write text in a box

SYNOPSIS
  etxtbox(text[,x[,y[,boxWidth[,boxHeight[,fontSize[,alignment
           [,font[,rotation[,color[,offset]]]]]]]]]])

PARAMETER(S)
  text          text string
  x             x of start position
```

```
  y             y of start position
  boxWidth      width of textbox
                default=eWinWidth
  boxHeight     height of textbox
  fontSize      scalar size of current font
                or vector [xSize ySize obliqueAngle(in deg)] of current font
  alignment     1=right 0=center -1=left 2=block
  font          font number (definition in einit.m)
  rotation      rotation of box (in deg)
  color         color of text, [r g b] vector
  offset        offset vector [x y] of text, default offset=[0 0]

GLOBAL PARAMETER(S)
  eTextColor
  eTextFont
  eTextAlignment
  eTextFontSize
  eTextLimitWord
  eTextLimitPara
  eTextBoxFeedLine
  eTextBoxFeedPara
```

3.7.4 etxtlpos.m

```
NAME
  etxtlpos  - get text line positions

SYNOPSIS
  [linePos,nLines]=etxtlpos(text)

PARAMETER(S)
  text        sting of text
  linePos     nLines x 2 Matrix of start and end positions
              [line1StartPos line1EndPos; line2StartPos line2EndPos ...
  nLines      number of lines
```

3.7.5 etxtread.m

```
NAME
  etxtread  - read text-file

SYNOPSIS
  [text,textLength]=etxtread(textFileName)

PARAMETER(S)
  textFileName  name of textfile
  text        sting of text
```

3.7.6 etxtwrit.m

```
NAME
  etxtwrit  - write string to text-file

SYNOPSIS
  etxtwrit(text,textFileName)

PARAMETER(S)
  text        sting of text
  textFileName  name of textfile
```

3.8 Symbol Functions

3.8.1 edsymbol.m

```
NAME
  edsymbol - define symbols for plotting

SYNOPSIS
  edsymbol(name,symbolFileName
           [,scaleX[,scaleY[,moveX[,moveY[,rotation[,color]]]]]])

PARAMETER(S)
  name              definition name for new symbol
  symbolFileName    filename of postscript symbol file (*.psd)
  scaleX            scale factor in X-direction
  scaleY            scale factor in Y-direction
  moveX             offset in X-direction
  moveY             offset in X-direction
  rotation          rotate symbol (deg)
  color             color vector [r g b], color of symbol
```

3.8.2 equiver.m

```
NAME
  equiver - draw a quiver plot of matrix

SYNOPSIS
  equiver(xData,yData,dx,dy[,color[,symbolName]])

PARAMETER(S)
  xData            vector or matrix of x-positions of the symbols
  yData            vector or matrix of y-positions of the symbols
  dx               vector or matrix of x-values to determine
                   the direction and relative magnitude of the symbols
  dy               vector or matrix of y-values to determine
                   the direction and relative magnitude of the symbols
  color            color of symbols, vector [r g b]
  symbolName       symbol name of edsymbol() function
```

```
                default symbol is an arrow

GLOBAL PARAMETER(S)
  ePlotAreaPos
  ePlotAreaWidth
  ePlotAreaHeight
  eXAxisSouthScale
  eYAxisWestScale
  ePlotAreaXValueStart
  ePlotAreaXValueEnd
  ePlotAreaYValueStart
  ePlotAreaYValueEnd
```

3.8.3 esymbol.m

```
NAME
  esymbol  - draw a defined symbol

SYNOPSIS
  esymbol(xPos,yPos,symbolName,[,scaleX[,scaleY[,rotation]]])

PARAMETER(S)
  xPos          x position
  yPos          y position
  symbolName    name of defined symbol
  scaleX        scale factor in x-direction
  scaleY        scale factor in y-direction
  rotation      rotate symbol (deg)
```

3.9 Table Functions

3.9.1 etabdef.m

```
NAME
  etabdef - defines a table

SYNOPSIS
  [colsXW rowsYH]=etabdef(rows,cols[,x,y[,width,height
                          [,colsWidth[,rowsHeight]]])

PARAMETER(S)
  rows       number of rows
  cols       number of columns
  x          x-position (sw-corner) of table
  y          y-position (sw-corner) of table
  width      width of table
  height     height of table
  colsWidth  vector of relative width of columns ([1 1 1 ... 1]==equal widths)
  rowsHeight vector of rel. height of columns ([1 1 1 ... 1]==equal heights)
  colsXW     matrix of x-positions and width of columns,
             size of matrix is (number of cols) X 2
```

```
              examples:  colsXW(5,1) = x-position of colum 5
                         colsXW(5,2) = width of colum 5
  rowsYH      matrix of y-positions and heigth of rows,
              size of matrix is (number of rows) X 2
              examples:  cellXW(5,1) = y-position of row 5
                         cellXW(5,2) = height of row 5

GLOBAL PARAMETER(S)
  eTabBackgroundColor
```

3.9.2 etabgrid.m

```
NAME
  etabgrid - draw lines of table

SYNOPSIS
  etabgrid(colsXW,rowsYH)

PARAMETER(S)
  colsXW      matrix of x-positions and width of columns,
              size of matrix is (number of cols) X 2
              examples:  cellXW(5,1) = x-position of colum 5
                         cellXW(5,2) = width of colum 5
  rowsYH      matrix of y-positions and heigth of rows,
              size of matrix is (number of rows) X 2
              examples:  cellXW(5,1) = y-position of row 5
                         cellXW(5,2) = height of row 5

GLOBAL PARAMETER(S)
```

3.9.3 etabtext.m

```
NAME
  etabtext - fill cell of table with text

SYNOPSIS
  etabtext(colsXW,rowsYH,row,col,text[,alignment
           [,font[,fontSize[,color[,bgColor]]]])

PARAMETER(S)
  colsXW      matrix of x-positions and width of columns,
              size of matrix is (number of cols) X 2
              examples:  cellXW(5,1) = x-position of colum 5
                         cellXW(5,2) = width of colum 5
  rowsYH      matrix of y-positions and heigth of rows,
              size of matrix is (number of rows) X 2
              examples:  cellXW(5,1) = y-position of row 5
                         cellXW(5,2) = height of row 5
  row         number of row
  col         number of column
  text        text of cell
  alignment   1=right 0=center -1=left
```

```
  font       font number (definition in einit.m)
  fontSize   relative fontsize in percent (100=default)
  color      color of text
  bgColor    color of background, [r g b] vector, if r<0 then transparent

GLOBAL PARAMETER(S)
 eTextColor
 eTextFont
```

3.10 Special Functions

3.10.1 ecdcover.m

```
NAME
  ecdcover  -  write a cdcover

SYNOPSIS
  ecdcover(title[,description[,author[,version[,date[,textColor
          [,frontImage[,background[,logo[,content]]]]]]]]])

PARAMETER(S)
  title          string of title of cd
  description    string of description, default=''
  author         string of author, default=''
  version        string of version, default=''
  date           string of time or date, default=''
  textColor      color vector [r g b]  [0 0 0]=black [1 1 1]=white,
                 default=[0 0 0]
  frontImage     filename of frontImage , default=''
  background     filename of background, default=''
  logo           filename  of logo, default=''
  content        filename(asci-file, tabs with '#')  of table of contents
```

3.10.2 ecolors.m

```
NAME
  ecolors - get a colormap defined in einit.m

SYNOPSIS
  colorMap=ecolors([mapNo [,nColors]])

PARAMETER(S)
  colorMap  matrix of nColors x 3 Values between 0 and 1
  mapNo     map number in the definition matrix eColorMaps (default=0)
  nColors   number of colors (default=64)

GLOBAL PARAMETER(S)
  eColorMaps
```

3.10.3 efillmat.m

```
NAME
  efillmat  - fill matrix with interpolated values by given xyz-samples

SYNOPSIS
  matrix=efillmat(xData,yData,zData,dX,dY)

PARAMETER(S)
  xData       vector of x-coordinates
  yData       vector of y-coordinates
  zData       vector of z-values
  dx          pixel distance of x-direction
  dy          pixel distance of y-direction
  matrix      interpolated matrix
```

3.10.4 egradient.m

```
NAME
  egradient - get numerical partial derivatives of matrix

SYNOPSIS
  [px py]=egradient(z[,dx[,dy]])

PARAMETER(S)

  px          px=dz/dx
  py          py=dz/dy
  z           z-matrix
  dx          delta x
  dy          delta y
```

3.10.5 einseps.m

```
NAME
  einseps  -  insert eps-file

SYNOPSIS
  einseps(xPos,yPos,epsFileName,[,scaleX[,scaleY[,rotation]]])

PARAMETER(S)
  xPos          x position
  yPos          y position
  epsFileName   name of eps-file
  scaleX        scale factor in x-direction
  scaleY        scale factor in y-direction
```

3.10.6 eisoline.m

```
NAME
```

```
  eisoline  - get isolines of a matrix

SYNOPSIS
  lines=eisoline(matrix,isoValue)

PARAMETER(S)
  lines       empty matrix or 2n x 2 matrix,
              n=number of lines x [x1 y1;x2 y2]
  matrix      matrix of values
  isoValue    value of isoline
```

3.10.7 ejpglist.m

```
NAME
  ejpglist  - generate photoprints of a JPEG-filelist

SYNOPSIS
  ejpglist([listFileName[,maxPhotoSize[,fitPhoto[,outputFileName]]]])

PARAMETER(S)
  listFileName          textfile of JPEG-filenames
                          one name per line
                        default=current directory
  maxPhotoSize          vector [width heigth] of photos
                        default=[90 120] (90mmx120mm)
  fitPhoto              switch, 0=off 1=fit photos to maxPhotoSize,default=0
  outputFileName        Praefix of eps-outputfile
                        default='photos' ->photos01.jpg,photos02.jpg, ...
```

3.10.8 elineip.m

```
NAME
  elineip  - linear interpolation of a vector

SYNOPSIS
  yi=elineip(x,y,xi)

PARAMETER(S)
  x             sample x vector
  y             sample y vector
  xi            x vector for interpolation
  yi            interpolated y vector
```

3.10.9 eplo2win.m

```
NAME
  eplo2win - transform coordinates , plotarea to window
```

```
SYNOPSIS
  [winX winY]=eplo2win(ploX,plotY)

PARAMETER(S)
  ploX     x-vector of coordinates of plotarea
  ploY     y-vector of coordinates of plotarea
  winX     x-vector of coordinates of window
  winY     y-vector of coordinates of window

GLOBAL PARAMETER(S)
```

3.10.10 eshadow.m

```
NAME
  eshadow  - make shadow image matrix

SYNOPSIS
  x=eshadow(matrix,nColors,colorMap,lumen,image)

PARAMETER(S)
  matrix             matrix for image
  nColors            number of colors
  colorMap           (nColors*nBrightnessLevels) x 3 Matrix
  lumen              light direction, [x,y,z] vector
  image              cover image
  x                  shadow image matrix
```

3.10.11 esubeps.m

```
NAME
  esubeps  -  insert eps-file in a subarea of the window

SYNOPSIS
  esubeps(nRows,nColumns,row,column,epsFileName)

PARAMETER(S)
  nRows          number of rows of the window
  nColumns       number of columns of the windows
  row            index of row
  column         index of column
  epsFileName    name of eps-file
```

3.10.12 ewinsize.m

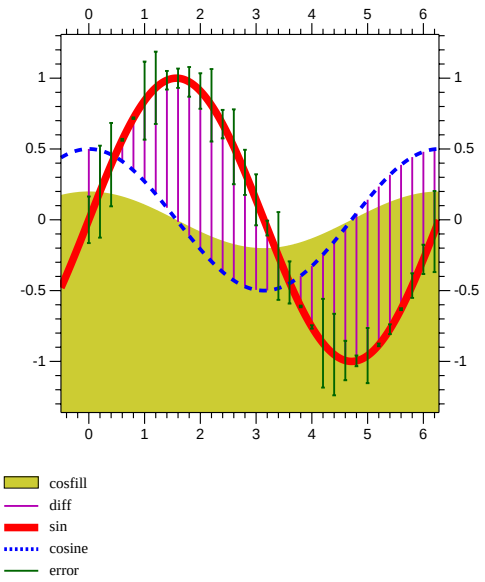
```
NAME
  ewinsize  -  get size of Bounding Box of eps-file

SYNOPSIS
  [width,height]=ewinsize([epsFileName])
```

```
PARAMETER(S)
  epsFileName   name of eps-file
                default: current eFileName
```

Appendix A

A.1 Examples

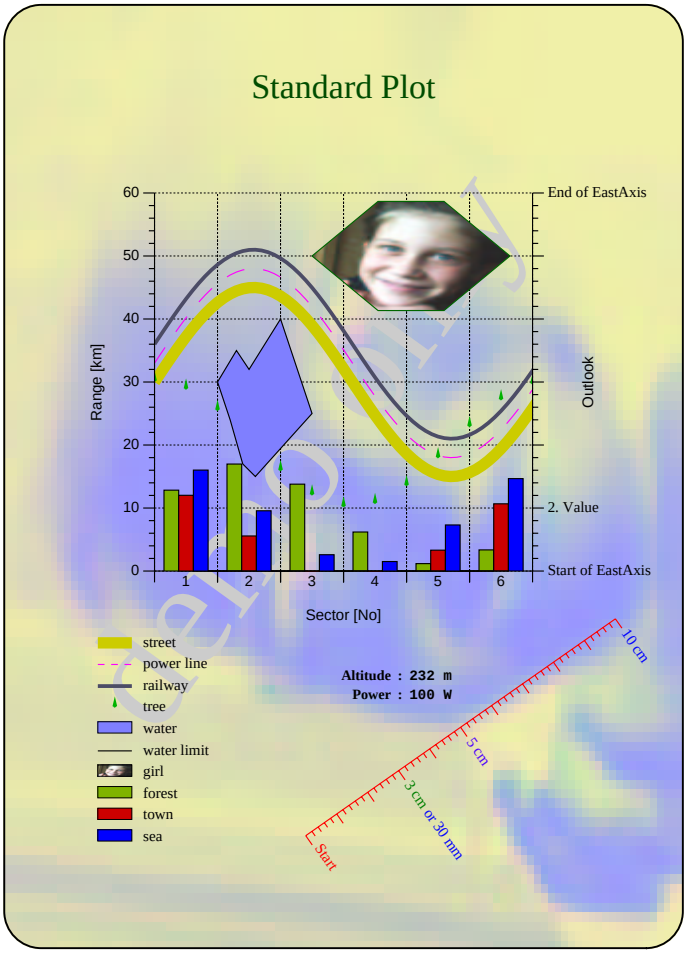
A.1.1 edemo1.m




```
x1=[-0.5:0.01:2*pi];
x2=[0:0.2:2*pi];


eopen('demo1.eps')                    % open eps-file and write eps-head

% fill area
```

```
eplot(x1,cos(x1)*0.2,'cosfill',-1,[0.8 0.8 0.2])

% plot single lines
eplot([x2;x2],[cos(x2)*0.5;sin(x2)],'diff',0,[0.7 0 0.7],0.5)

% plot red solid line
eplot(x1,sin(x1),'sin',0,[1 0 0],2)

% plot blue dash line
eplot(x1,cos(x1)*0.5,'cosine',2,[0 0 1],1)

% plot errorbar
error=rand(size(x2))/3;
[xm ym]=eerrbar(x2,sin(x2),error);
eplot(xm,ym,'error',0,[0 0.4 0],0.5);

eclose                                  % close eps-file
eview                                   % start ghostview with eps-file
```

A.1.2 edemo2.m



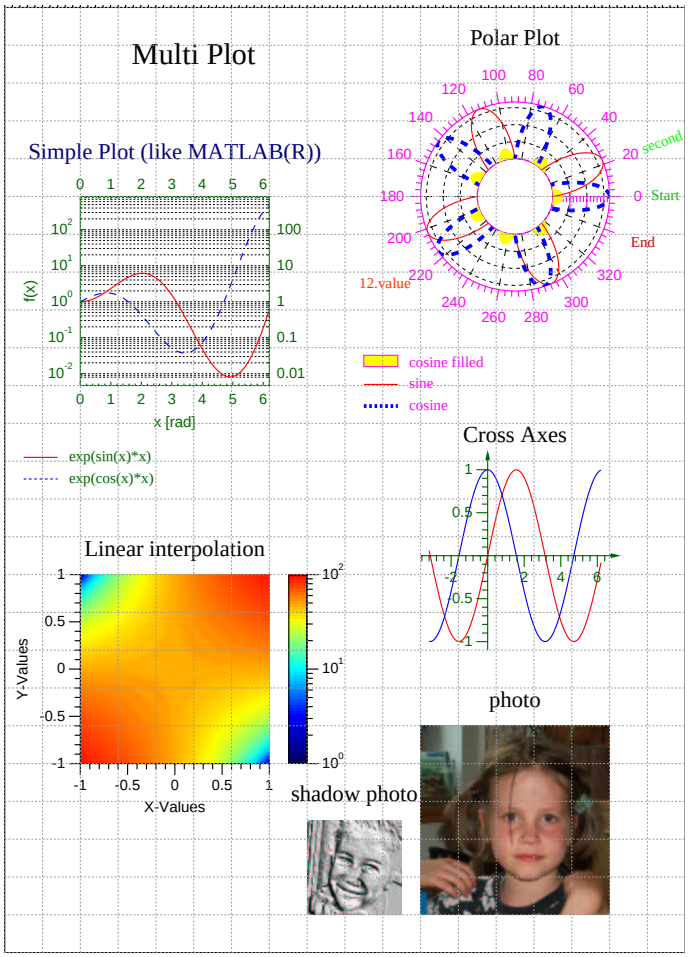
edemo2.m

```
% standard plot
eopen('demo2.eps')                      % open eps-file and write eps-head
```

```
eglobpar                                % get access to global parameters
eXAxisSouthLabelText='Sector [No]';     % set South Label of XAxis
eXAxisSouthScaleType=1;                 % set classes scaling
eYAxisWestLabelText='Range [km]';       % set West Label of YAxis
eYAxisEastLabelText='Outlook';          % set East Label of YAxis
eXAxisNorthVisible=0;                   % switch North-XAxis off
eYAxisEastValueVisible=0;               % switch East-YAxis Values off
eXGridVisible=1;                        % switch x-Grid on
eYGridVisible=1;                        % switch y-Grid on

% background
[im cm]=eimgread; % read standard image
cm=econtra(cm,200,[1 2]);  % change contrast of image
cm=ebright(cm,60);  % change brightness of image
im=eimgrot(im,90);  % rotate image
eframe(0,0,eWinWidth,eWinHeight,0,im,cm,0,10); % print background image

% frame
eframe(0,0,eWinWidth,eWinHeight,0.5,0,[0 0 0],0,10); % draw frame around window
etext('demo only',eWinWidth/2,eWinHeight/2,40,0,1,...   %print demo text
     atan(eWinHeight/eWinWidth)*180/pi,[0.8 0.8 0.8])
eXAxisSouthScale=[0 0 6];  %set scale x-axis
eYAxisWestScale=[0 10 60]; %set scale y-axis

etitle('Standard Plot',25,9,[0 0.3 0])         % print title

% 1. plot lines
x=0:0.1:2*pi;
eplot(x,sin(x)*15+30,'street',0,[0.8 0.8 0],3) %solid line
eplot(x,sin(x)*15+33,'power line',5,[1 0 1]) % dash plot
eplot(x,sin(x)*15+36,'railway',0,[0.3 0.3 0.4],1) % solid line

% 2. plot symbols
x=0:0.5:2*pi;
edsymbol('spire','spire.psd',0.3,0.3,0,0,90) % define symbol with name 'spire'
eplot(x,cos(x)*10+20,'tree','spire',[0 0.7 0]) % plot trees

% 3. plot area
lake=[1 30;1.3 35;1.5 32;2 40;2.5 25;1.6 15;1.4 17;1.2 24;1 30];
eplot(lake(:,1),lake(:,2),'water',-1,[0.5 0.5 1]); % filled area,dash<0
eplot(lake(:,1),lake(:,2),'water limit',0,[0 0 0]); % solid line around the area

% 4. plot image
x1=0:pi/3:pi;
x1=x1';
x2=flipud(x1);
girl=[x1+2.5 sin(x1)*10+50;x2+2.5 -sin(x2)*10+50];
im=eimgread;
eplot(girl(:,1),girl(:,2),'girl',im,-1); % fill area with image
eplot(girl(:,1),girl(:,2),'',0,[0 0.4 0]); % solid line around the image

% 5. plot bars
x=0.5:1:5.5;
[xb yb]=ebar(sin(x)*8+9,0,1,3);     % 1. bars
```

```
eplot(xb,yb,'forest',-1,[0.5 0.7 0])
eplot(xb,yb,'',0,[0 0 0])
[xb yb]=ebar(cos(x)*8+5,0,2,3);     % 2. bars
eplot(xb,yb,'town',-1,[0.8 0 0])
eplot(xb,yb,'',0,[0 0 0])
[xb yb]=ebar(cos(x)*8+9,0,3,3);     % 3. bars
eplot(xb,yb,'sea',-1,[0 0 1])
eplot(xb,yb,'',0,[0 0 0])
eplot

% write parameters
eParamPos=[80,70];
eParamFontSize=5;
eparam('Altitude','232 m')
eparam('Power','100 W')
valuePos=eYAxisEastValuePos;
posNo=1;
etext('Start of EastAxis',valuePos(posNo,1),valuePos(posNo,2),4,4);
posNo=2;
etext('2. Value',valuePos(posNo,1),valuePos(posNo,2),4,4);
posNo=7;
etext('End of EastAxis',valuePos(posNo,1),valuePos(posNo,2),4,4);

% axis
eYAxisEastScaleType=0;                % set linear scaling
eYAxisEastValueVisible=0;             % no values visible
angle=-55;
eaxis(80,30,100,'e',[0 1 10],angle,[1 0 0]);
valuePos=eYAxisEastValuePos;
posNo=1;
etext('Start',valuePos(posNo,1),valuePos(posNo,2),4,1,1,angle,[1 0 0]);
posNo=4;
etext('3 cm',valuePos(posNo,1),valuePos(posNo,2),4,4,1,angle,[0 0.5 0]);
etext(' or 30 mm',0,0,4,4,1,angle,[0 0 1]);
posNo=6;
etext('5 cm',valuePos(posNo,1),valuePos(posNo,2),4,4,1,angle,[0.3 0 1]);
posNo=11;
etext('10 cm',valuePos(posNo,1),valuePos(posNo,2),4,4,1,angle,[0 0 1]);

eclose                                % close ps output
eview                                 % start ghostview with eps-file
```

A.1.3 edemo3.m

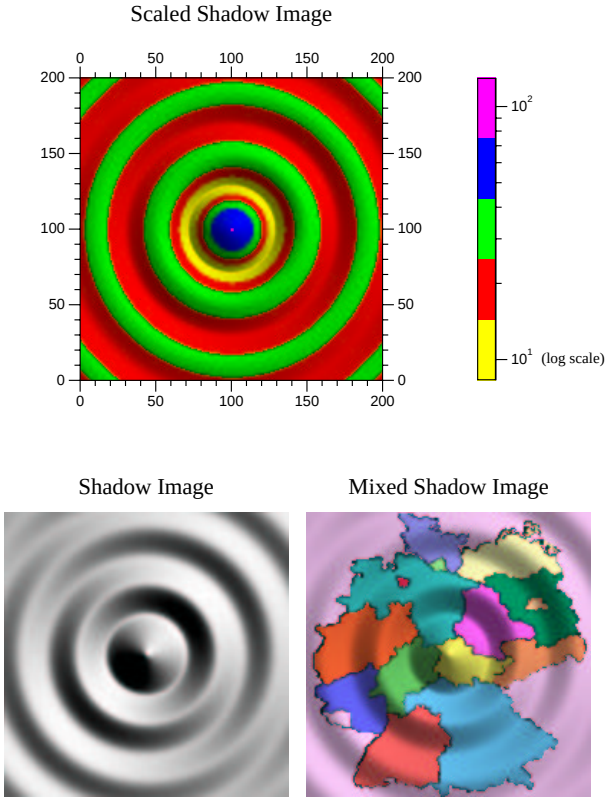



```
eopen('demo3.eps');
eglobpar;                       % get access to global parameters
eWinGridVisible=1;
esavpar;    % save default parameter

%title
etext('Multi Plot',50,eWinHeight-15,8,0,1)

% set tics like Matlab
eAxesValueSpace=3;
eAxesTicLongLength=-1;
eAxesTicShortLength=-0.5;

% simple plot
eAxesColor=[0 0.4 0];
ePlotAreaPos=[20 150];
ePlotAreaHeight=50;
ePlotAreaWidth=50;
eYAxisWestLabelText='f(x)';
eXAxisSouthLabelText='x [rad]';
etitle('Simple Plot (like MATLAB(R))',10,6,[0 0 0.5]);
eYAxisWestScaleType=2;
```

```
eYGridVisible=1;
xData=0:0.1:2*pi;
eYAxisEastValueFormat=2;
eplot(xData,exp(sin(xData).*xData),'exp(sin(x)*x)',0,[1 0 0]);
eplot(xData,exp(cos(xData).*xData),'exp(cos(x)*x)',2,[0 0 1]);
eplot;

% polar plot
erespar; % set default parameter
eAxesColor=[1 0 1];
ePolarPlotAreaCenterPos=[135 200];
ePolarPlotAreaRadMin=10;
ePolarPlotAreaRadMax=25;
ePolarAxisRadValueVisible=0;
ePlotTitleDistance=15;
ePlotTitleText='Polar Plot';
xData=0:0.01:2*pi;
ePolarAxisRadScale=[0 0.3 1];
epolar(xData,cos(xData*7)*0.2,'cosine filled',-1,[1 1 0]);
epolar(xData,sin(xData*4),'sine',0,[1 0 0]);
epolar(xData,cos(xData*5),'cosine',2,[0 0 1],1);
epolar;
angles=ePolarAxisAngValueAngle*pi/180;
dis=11;
lPos=[cos(angles) sin(angles)]*(ePolarPlotAreaRadMax+dis);
lPos=[lPos(:,1)+ePolarPlotAreaCenterPos(1)...
      lPos(:,2)+ePolarPlotAreaCenterPos(2)];
i=1;
etext('Start',lPos(i,1),lPos(i,2),4,4,1,0,[0 0.8 0]);
i=2;
etext('second',lPos(i,1),lPos(i,2),4,4,1,ePolarAxisAngValueAngle(i),[0 1 0]);
i=12;
etext('12.value',lPos(i,1),lPos(i,2),4,2,1,0,[1 0.2 0]);
i=18;
ellipseW=2*(dis-eAxesTicLongLength);
eellipse(lPos(i,1),lPos(i,2),ellipseW,ellipseW,0,-1,[1 1 1]); % cover value
etext('End',lPos(i,1),lPos(i,2),4,3,1,0,[0.8 0 0]);

%  cross axes plot
erespar; % set default parameter
eAxesColor=[0 0.4 0];
ePlotAreaPos=[110 80];
ePlotAreaHeight=50;
ePlotAreaWidth=50;
ePlotTitleDistance=5;
ePlotTitleText='Cross Axes';
eAxesCrossOrigin=2;  % cross axes with arrows
xData=-3.2:0.1:6.2;
eplot(xData,sin(xData),'',0,[1 0 0]);
eplot(xData,cos(xData),'',0,[0 0 1]);
eplot

% random image
erespar; % set default parameter
```

```
ePlotAreaPos=[20 50];
ePlotAreaHeight=50;
ePlotAreaWidth=50;
eYAxisWestLabelText='Y-Values';
eXAxisSouthLabelText='X-Values';
eImageLegendPos=[0 -5];
ePlotTitleDistance=5;
ePlotTitleText='Linear interpolation';
eXAxisNorthVisible=0;
eYAxisEastVisible=0;
%matrix=rand(30,30);
matrix=efillmat([1 -1 -1 1],[1 1 -1 -1],[100 1 100 1],0.02,0.02);
eImageLegendScaleType=2;
eXAxisSouthScale=[-1 0 1];  %set scale x-axis
eYAxisWestScale=[-1 0 1]; %set scale y-axis
eimagesc(matrix,ecolors(3),'e'); % print scaled image

% photo
erespar; % set default parameter
ePlotAreaPos=[110 10];
ePlotAreaHeight=50;
ePlotAreaWidth=50;
ePlotTitleDistance=5;
ePlotTitleText='photo';
eImageLegendVisible=0;
eimage([ePath 'default.jpg']);  % print a JPEG-file

% shadow photo
erespar; % set default parameter
ePlotAreaPos=[80 10];
ePlotAreaHeight=25;
ePlotAreaWidth=25;
ePlotTitleDistance=5;
ePlotTitleText='shadow photo';
[photo colormap]=eppmread; % read default image
eshadoi(photo); % print shadow image

eclose;
eview;
```

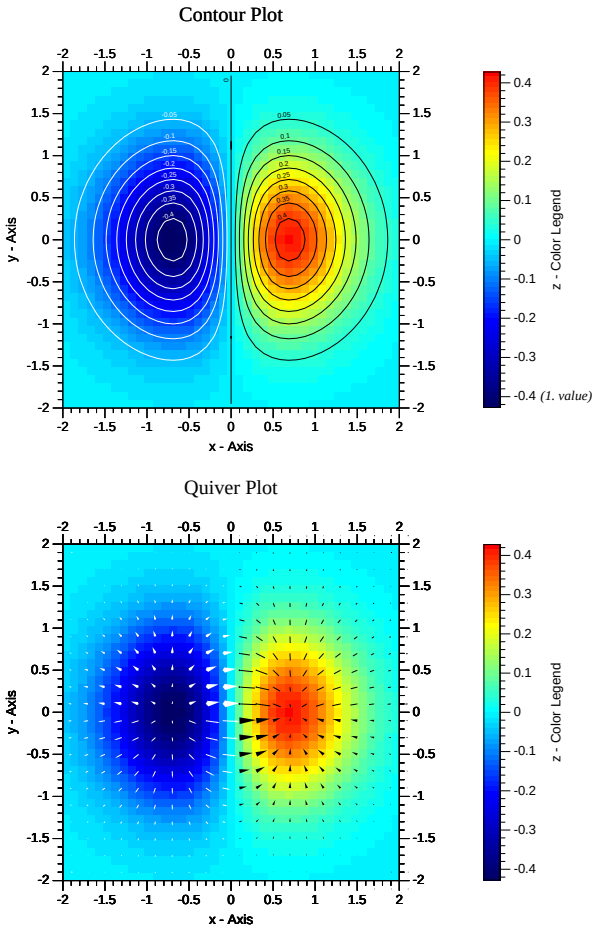
A.1.4 edemo4.m




```
eopen('demo4.eps');
eglobpar;

[img cm]=eppmread([ePath 'defMap.ppm']);
n=size(img,1);
delta=10*pi/(n-1);
x=-5*pi:delta:5*pi;
[a b]=meshgrid(x,x);
R=sqrt(a.^2+b.^2) + eps;
matrix=100*(sin(R)./R+0.3);

% scaled shadow image
ePlotAreaPos=[30 140];
ePlotAreaHeight=80;
ePlotAreaWidth=80;
ePlotTitleDistance=15;
eImageLegendScaleType=2;
ePlotTitleText='Scaled Shadow Image';
colorMap=[1 1 0;1 0 0;0 1 0;0 0 1;1 0 1];
eshadois(matrix,colorMap,'e');
etext('        (log scale)',eImageLegendValuePos(1,1),...
  eImageLegendValuePos(1,2),4,4,1);
```

```
% shadow image
ePlotAreaPos=[10 30];
ePlotAreaHeight=75;
ePlotAreaWidth=75;
ePlotTitleDistance=5;
ePlotTitleText='Shadow Image';
eshadoi(matrix);

% mixed shadow image
ePlotAreaPos=[90 30];
ePlotAreaHeight=75;
ePlotAreaWidth=75;
ePlotTitleDistance=5;
ePlotTitleText='Mixed Shadow Image';
eshadoix(matrix,img,cm);

eclose;
eview;
```

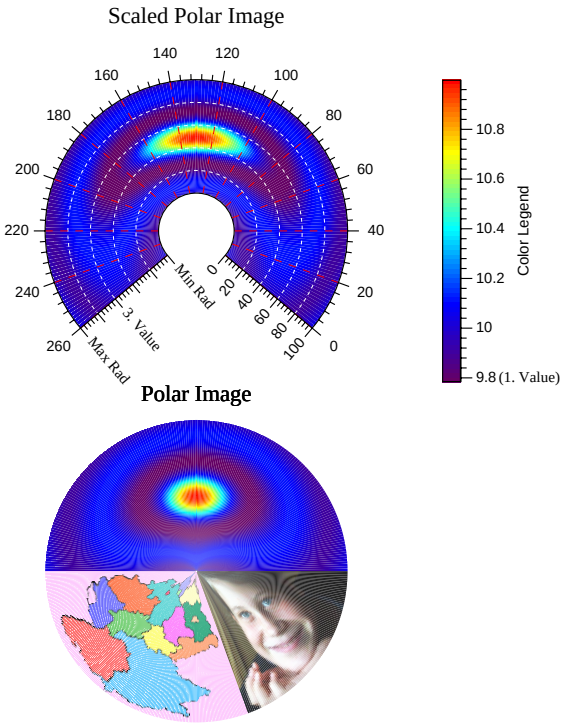
A.1.5 edemo5.m



```
x=-2:.1:2;
y=-2:.1:2;
[X,Y]=meshgrid(x,y);
matrix=X.*exp(-X.^2-Y.^2);

% contour plot
eopen('demo5a.eps',0,180,140);
eglobpar;
ePlotTitleText='Contour Plot';
ePlotTitleDistance=15;
ePlotAreaPos=[20 20];
eXAxisSouthLabelText='x - Axis';
eYAxisWestLabelText='y - Axis';
eImageLegendLabelText='z - Color Legend';
eContourValueVisible=1;
eaxes([-2 0 2],[-2 0 2]);
eimagesc(matrix,ecolors(3),'e');
etext('        (1. value)',eImageLegendValuePos(1,1),...
  eImageLegendValuePos(1,2),4,4,2);
econtour(matrix,[-0.5 0.05 0.5],0,[1 1 1;0 0 0;0 0 0]);
eclose(1,0);


% quiver plot
eopen('demo5b.eps',0,180,140);
eglobpar;
ePlotTitleText='Quiver Plot';
ePlotTitleDistance=15;
ePlotAreaPos=[20 20];
eXAxisSouthLabelText='x - Axis';
eYAxisWestLabelText='y - Axis';
eImageLegendLabelText='z - Color Legend';
eaxes([-2 0 2],[-2 0 2]);
eimagesc(matrix,ecolors(3),'e');

% sw
x=-2.1:.2:-0.1;
y=-2.1:.2:-0.1;
[X,Y]=meshgrid(x,y);
qmatrix=X.*exp(-X.^2-Y.^2);
[dx dy]=egradient(qmatrix,.2,.2);
equiver(X,Y,dx,dy,[1 1 1]);

% nw
x=-2.1:.2:-0.1;
y=0.1:.2:2.1;
[X,Y]=meshgrid(x,y);
qmatrix=X.*exp(-X.^2-Y.^2);
[dx dy]=egradient(qmatrix,.2,.2);
edsymbol('spire','spire.psd');
equiver(X,Y,dx,dy,[1 1 1],'spire');

% ne
x=0.1:.2:2.1;
```

```
y=0.1:.2:2.1;
[X,Y]=meshgrid(x,y);
qmatrix=X.*exp(-X.^2-Y.^2);
[dx dy]=egradient(qmatrix,.2,.2);
edsymbol('needle','needle.psd');
equiver(X,Y,dx,dy,[0 0 0],'needle');

% se
x=0.1:.2:2.1;
y=-2.1:.2:-0.1;
[X,Y]=meshgrid(x,y);
qmatrix=X.*exp(-X.^2-Y.^2);
[dx dy]=egradient(qmatrix,.2,.2);
edsymbol('ftria','ftria.psd',1,0.4);
equiver(X,Y,dx,dy,[0 0 0],'ftria');

eclose(1,0);

% quiver and contour
eopen('demo5.eps')
esubeps(2,1,1,1,'demo5a.eps');
esubeps(2,1,2,1,'demo5b.eps');
eclose
eview
```

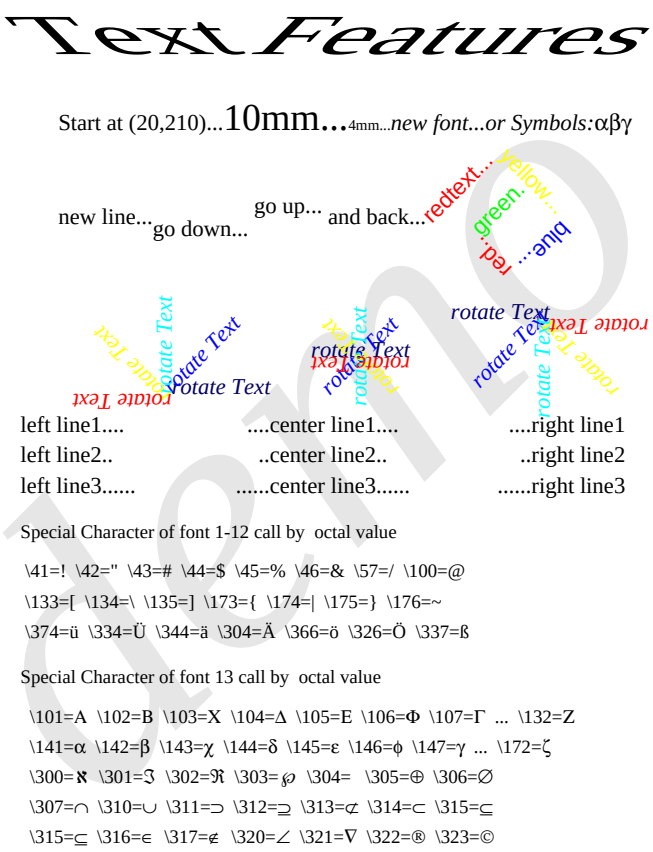
A.1.6 edemo6.m




```
eopen('demo6.eps');
eglobpar;

% scaled polar image plot
x=-3*pi:0.1:3*pi;
[a b]=meshgrid(x,x);
R=sqrt(a.^2+b.^2) + eps;
matrix=sin(R)./R+10;
ePlotTitleText='Scaled Polar Image';
ePlotTitleDistance=15;
ePolarPlotAreaCenterPos=[70,170];
ePolarPlotAreaRadMax=40;
ePolarPlotAreaAngStart=-40;
ePolarPlotAreaAngEnd=220;
ePolarAxisRadVisible=3;
ePolarAxisRadValueVisible=1;
ePolarRadiusGridColor=[1 1 1];
ePolarAngleGridColor=[1 0 0];
eImageLegendLabelText='Color Legend';
matrix=epolaris(matrix,ecolors(2),'e');
etext('Max Rad',ePolarAxisRadValuePos(1,3),ePolarAxisRadValuePos(1,4),...
  4,4,1,ePolarPlotAreaAngEnd+90);
```

```
etext('3. Value',ePolarAxisRadValuePos(3,3),ePolarAxisRadValuePos(3,4),...
  4,4,1,ePolarPlotAreaAngEnd+90);
etext('Min Rad',ePolarAxisRadValuePos(6,3),ePolarAxisRadValuePos(6,4),...
  4,4,1,ePolarPlotAreaAngEnd+90);
etext('      (1. Value)',eImageLegendValuePos(1,1),eImageLegendValuePos(1,2),...
  4,4,1);

% polar image plot
ePlotTitleText='Polar Image';
ePlotTitleDistance=5;
ePolarPlotAreaCenterPos=[70,80];
ePolarPlotAreaRadMin=0;
ePolarPlotAreaRadMax=40;

ePolarPlotAreaAngStart=0;
ePolarPlotAreaAngEnd=180;
epolari(matrix,ecolors(2));

[matrix cm]=eppmread([ePath 'defMap.ppm']);
ePolarPlotAreaAngStart=180;
ePolarPlotAreaAngEnd=290;
epolari(matrix,cm);

[matrix cm]=eppmread([ePath 'default.ppm']);
ePolarPlotAreaAngStart=290;
ePolarPlotAreaAngEnd=360;
epolari(matrix,cm);

eclose;
eview;
```

A.1.7 edemo7.m




```
eopen('demo7.eps');
eglobpar;

%a few global parameter
eTextFont=1;
eTextFontSize=6;

%titel
etext('Text',15,230,[15*2 15 -45]);
etext('Features',0,0,[15*2 15 45]);

%append text
etext('demo',30,30,100,1,2,45,[0.9 0.9 0.9]);
etext('Start at (20,210)...',20,210);
etext('10mm...',0,0,10);
etext('4mm...',0,0,4);
etext('new font...or Symbols:',0,0,6,1,2);
etext('\\141\\142\\147',0,0,6,1,13);
etext('new line...',20,185);
etext('go down... ',0,-3);
etext('go up... ',0,6);
etext('and back... ',0,-3);
```

```
etext('redtext... ',0,0,6,1,5,45,[1 0 0]);
etext('yellow... ',0,0,6,1,5,-45,[1 1 0]);
etext('blue... ',0,0,6,1,5,-135,[0 0 1]);
etext('red..',0,0,6,1,5,-225,[1 0 0]);
etext('green. ',0,0,6,1,5,45,[0 1 0]);
colorMap=ecolors(3,5);

% rotation
etext('rotate Text',50,140,6,1,2,0,colorMap(1,:));
etext('rotate Text',50,140,6,1,2,45,colorMap(2,:));
etext('rotate Text',50,140,6,1,2,90,colorMap(3,:));
etext('rotate Text',50,140,6,1,2,135,colorMap(4,:));
etext('rotate Text',50,140,6,1,2,180,colorMap(5,:));

etext('rotate Text',100,150,6,0,2,0,colorMap(1,:));
etext('rotate Text',100,150,6,3,2,45,colorMap(2,:));
etext('rotate Text',100,150,6,3,2,90,colorMap(3,:));
etext('rotate Text',100,150,6,3,2,135,colorMap(4,:));
etext('rotate Text',100,150,6,0,2,180,colorMap(5,:));

etext('rotate Text',150,160,6,-1,2,0,colorMap(1,:));
etext('rotate Text',150,160,6,-1,2,45,colorMap(2,:));
etext('rotate Text',150,160,6,-1,2,90,colorMap(3,:));
etext('rotate Text',150,160,6,-1,2,135,colorMap(4,:));
etext('rotate Text',150,160,6,-1,2,180,colorMap(5,:));

% left  center right
lineStep=-8;
yValue=130;
etext('left line1....',10,yValue,6,1);
etext('....center line1....',90,yValue,6,0);
etext('....right line1',170,yValue,6,-1);
yValue=yValue+lineStep;
etext('left line2..',10,yValue,6,1);
etext('..center line2..',90,yValue,6,0);
etext('..right line2',170,yValue,6,-1);
yValue=yValue+lineStep;
etext('left line3......',10,yValue,6,1);
etext('......center line3......',90,yValue,6,0);
etext('......right line3',170,yValue,6,-1);

%special character
eTextFont=1;
eTextFontSize=5;
xValue=10;
yValue=yValue+1.5*lineStep;
etext('Special Character of font 1-12 call by  octal value',xValue,yValue);
s=' ';
for i=[33,34,35,36,37,38,47,64]
  c=sprintf('\\134%o=\\%o  ',i,i);
  s=[s,c];
end
yValue=yValue+1.3*lineStep;
etext(s,xValue,yValue);
```

```
s=' ';
for i=[91,92,93,123,124,125,126]
  c=sprintf('\\134%o=\\%o  ',i,i);
  s=[s,c];
end
yValue=yValue+lineStep;
etext(s,xValue,yValue);
s=' ';
for i=[252,220,228,196,246,214,223]
  c=sprintf('\\134%o=\\%o  ',i,i);
  s=[s,c];
end
yValue=yValue+lineStep;
etext(s,xValue,yValue);

yValue=yValue+1.5*lineStep;
etext('Special Character of font 13 call by  octal value',xValue,yValue);
yValue=yValue+1.3*lineStep;
etext('',xValue,yValue);
for i=65:71
  c=sprintf('  \\134%o=',i);
  s=sprintf('\\%o',i);
  etext(c,0,0,eTextFontSize,1);
  etext(s,0,0,eTextFontSize,1,13);
end
etext('  ...',0,0,eTextFontSize,1);
i=90;
c=sprintf('  \\134%o=',i);
s=sprintf('\\%o',i);
etext(c,0,0,eTextFontSize,1);
etext(s,0,0,eTextFontSize,1,13);
yValue=yValue+lineStep;
etext('',xValue,yValue);
for i=97:103
  c=sprintf('  \\134%o=',i);
  s=sprintf('\\%o',i);
  etext(c,0,0,eTextFontSize,1);
  etext(s,0,0,eTextFontSize,1,13);
end
etext('  ...',0,0,eTextFontSize,1);
i=122;
c=sprintf('  \\134%o=',i);
s=sprintf('\\%o',i);
etext(c,0,0,eTextFontSize,1);
etext(s,0,0,eTextFontSize,1,13);
yValue=yValue+lineStep;
etext('',xValue,yValue);
for i=192:198
  c=sprintf('  \\134%o=',i);
  s=sprintf('\\%o',i);
  etext(c,0,0,eTextFontSize,1);
  etext(s,0,0,eTextFontSize,1,13);
end
yValue=yValue+lineStep;
```

```
etext('',xValue,yValue);
for i=199:205
  c=sprintf('  \\134%o=',i);
  s=sprintf('\\%o',i);
  etext(c,0,0,eTextFontSize,1);
  etext(s,0,0,eTextFontSize,1,13);
end
yValue=yValue+lineStep;
etext('',xValue,yValue);
for i=205:211
  c=sprintf('  \\134%o=',i);
  s=sprintf('\\%o',i);
  etext(c,0,0,eTextFontSize,1);
  etext(s,0,0,eTextFontSize,1,13);
end

eclose;
eview;
```

A.1.8 edemo8.m

Symbols

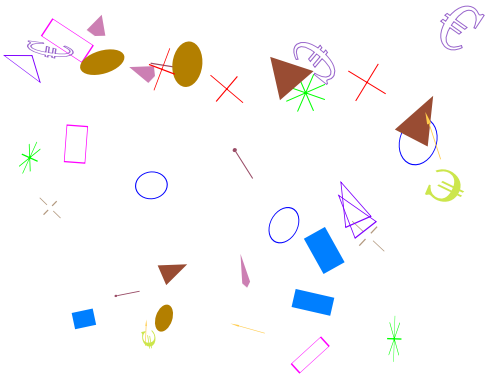


Table of Symbols

No	Filename	Symbol
1.	oplus.psd	
2.	plus.psd	
3.	star.psd	
4.	ring.psd	
5.	fring.psd	
6.	rect.psd	
7.	frect.psd	
8.	tria.psd	
9.	ftria.psd	
10.	spire.psd	
11.	farrow.psd	
12.	needle.psd	
13.	euro.psd	
14.	feuro.psd	

```
% standard plot
eopen('demo8.eps')                    % open eps-file and write eps-head
```

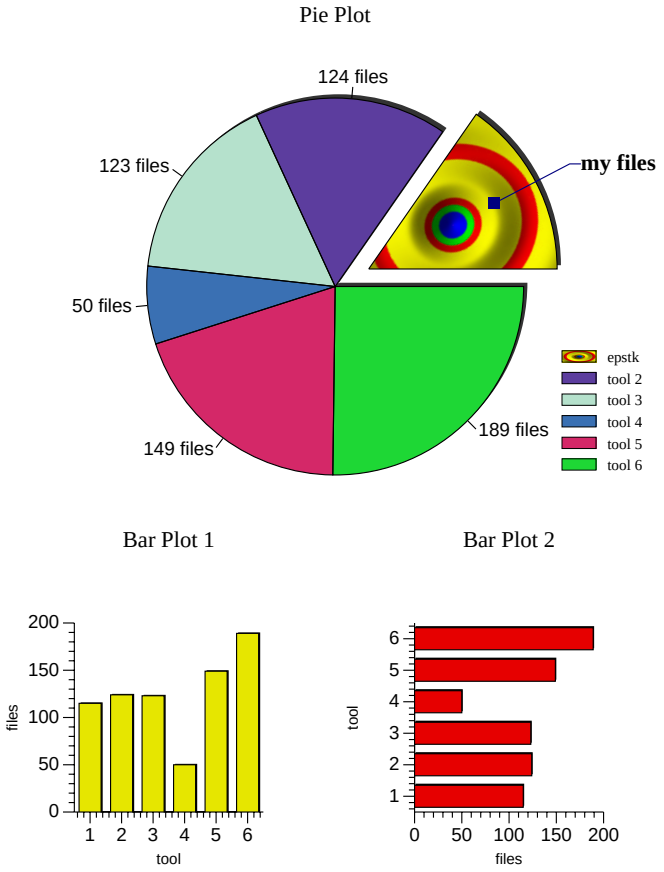
```
eglobpar                                % get access to global parameters
%eWinGridVisible=1;
etext('Symbols ',eWinWidth/2,eWinHeight-10,10,0)
sFiles=['oplus.psd ';'plus.psd  ';'star.psd  ';'ring.psd  ';...
        'fring.psd ';'rect.psd  ';'frect.psd ';'tria.psd  ';...
        'ftria.psd ';'spire.psd ';'farrow.psd';'needle.psd';...
        'euro.psd  ';'feuro.psd '];
sColors=[0.7 0.6 0.5;1 0 0;0 1 0;0 0 1;0.7 0.5 0;1 0 1;...
         0 0.5 1;0.5 0 1;0.6 0.3 0.2;0.8 0.5 0.7;...
         1 0.8 0.3;0.6 0.3 0.4;0.6 0.4 0.8;0.8 0.9 0.3];

%define symbols
nSym=14;
for i=1:nSym
  edsymbol(sprintf('s%d',i),sFiles(i,:),... % define symbol
           1,1,0,0,0,sColors(i,:));
end

%draw symbols
nPos=40;
randPos=rand(nPos,2);
xPos(:,1)=randPos(:,1)*eWinWidth*0.7+eWinWidth*0.1;
yPos(:,2)=randPos(:,2)*eWinHeight*0.35+eWinHeight*0.56;
for i=1:nPos
  symbol=sprintf('s%d',rem(i,nSym)+1);
  esymbol(xPos(i,1),yPos(i,2),symbol,randPos(i,1)+0.4,...
  randPos(i,2)+0.3,(randPos(i,1)-randPos(i,2))*360);% draw symbol
end

etext('Table of Symbols ',eWinWidth/2,115,10,0);

%body of table
[tabx,taby]=etabdef(nSym,3,40,10,100,90,[1 3 2]);
for i=1:nSym
  etabtext(tabx,taby,i,1,sprintf('%d.',i),-1);
  etabtext(tabx,taby,i,2,sFiles(i,:),1,1,80,[0 0 0],sColors(i,:));
  esymbol(tabx(3,1)+tabx(3,2)/2,...
          taby(i,1)+taby(i,2)/2,...
          sprintf('s%d',i),0.5,0.5);

end
etabgrid(tabx,taby);

%head of table
[htabx htaby]=etabdef(1,3,40,100,100,8,[1 3 2],1);
etabtext(htabx,htaby,1,1,'No',0,3);
etabtext(htabx,htaby,1,2,'Filename',0,3);
etabtext(htabx,htaby,1,3,'Symbol',0,3);
eclose                                  % close eps-file
eview                                   % start ghostview with eps-file
```

A.1.9 edemo9.m


```
eopen('demo9.eps')                    % open eps-file and write eps-head
eglobpar;

titleFile='demo_title.ppm';
backgrFile='demo_backgr.ppm';
logoFile='demo_logo.ppm';
contentFile='demo_content.txt';

%make title image
[titleImg titleCM]=eppmread([ePath 'default.ppm']); % read image
swCM=titleCM(:,1)+titleCM(:,2)+titleCM(:,3);
swCM=swCM/max(swCM);
titleCM=[swCM swCM swCM]; % color -> gray
eppmwrit(titleFile,titleImg,titleCM); % save image

%make background image
[backImg backCM]=eshadoi; % get default shadow image
backCM(:,2:3)=0; % red colormap
eppmwrit(backgrFile,backImg,backCM); % save image

%make logo image
[logoImg logoCM]=eshadois; % get default shadow image
```

```
eppmwrit(logoFile,logoImg,logoCM); % save image

%content
lf=setstr(10); %linefeed
contenttext=[
  'New features:' lf ...
  '#log scaled axes###'  lf ...
  '#return long tic positions of axes###'  lf ...
  '#new image functions e.g. ebright,econtra,eimgrot###' lf ...
  '#text functions etxtbox, etxtread, etxtlpos###' lf ...
  '#pie plot and error bars###' lf ...
  '#linear interpolation with elineip and efillmat###' lf  ...
  '#frames, circles, ellipses###' lf ...
  '#ASCII85 bitmap code, generates small EPS-files###' lf ...
  '#JPEG-file integration###' lf ...
  '#bugs removed in eopen, ehead, egridcl ...###' lf ...
  ];
etxtwrit(contenttext,contentFile);

% make cover

ecdcover('The EpsTk',...
         'Graphic for Octave & MATLAB(R)',...
         'St.Mueller',...
         'Version 2.0',...
         '2003',...
         [1 1 0],...
         titleFile,backgrFile,...
         logoFile,contentFile);


eclose
eview
```

A.1.10 edemo10.m

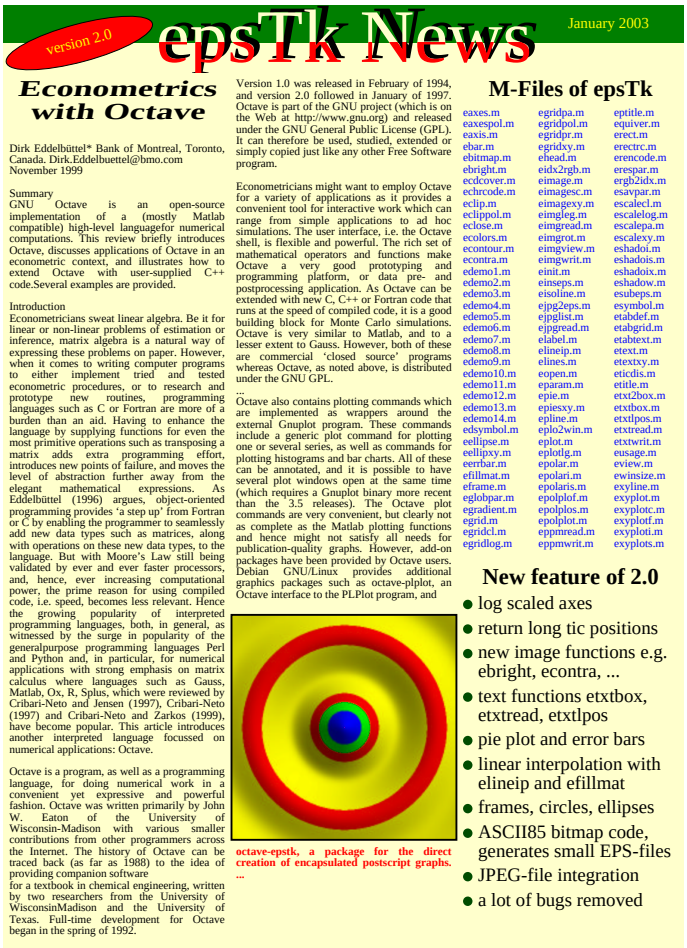



```
eopen('demo10.eps');
eglobpar
[im icm]=eshadois;
data=[115 124 123 50 149 189];
n=length(data);
cm=ecolors(3,n);

ePolarPlotAreaRadMin=0;
ePolarPlotAreaAngEnd=360;
%data=data/sum(data)
shadowColor=[0.2 0.2 0.2];
ePlotLegendPos=[ePolarPlotAreaRadMax*2.2 30];
legend=['epstk ';'tool 2';'tool 3';'tool 4';'tool 5';'tool 6'];

offset=10;

%shadow pie
epie(data(1),'','',-1,offset,shadowColor);
for i=2:n
  epie(data(i),'','',-1,0,shadowColor);
end
epie;
```

```
%color pie
ePolarPlotAreaCenterPos=ePolarPlotAreaCenterPos-[1 1];
eAxesValueFontSize=5;
epie(data(1),'',legend(1,:),im,offset,icm);
for i=2:n
  epie(data(i),sprintf('%d files',data(i)),legend(i,:),-1);
end
epie;

%frame pie
ePlotTitleText='Pie Plot';
epie(data(1),'','',0,offset);
for i=2:n
  epie(data(i));
end
angles=epie;

%label
labelColor=[0 0 0.5];
labelAngle=(angles(1,1)+angles(1,2)/2)*pi/180;
p1=ePolarPlotAreaCenterPos+[cos(labelAngle) sin(labelAngle)]*...
  (offset+ePolarPlotAreaRadMax*3/4);
p2=ePolarPlotAreaCenterPos+[cos(labelAngle) sin(labelAngle)]*...
  (offset+ePolarPlotAreaRadMax+10);
p3=[ePolarPlotAreaCenterPos(1)+ePolarPlotAreaRadMax+offset+5 p2(2)];
pline=[p1;p2;p3];
epline(pline(:,1),pline(:,2),eLineWidth,0,labelColor);
edsymbol('dot','frect.psd',0.3,0.3,0,0,0,labelColor);
esymbol(p1(1),p1(2),'dot');
etext('my files',p3(1),p3(2),6,4,3);

ePlotAreaHeight=50;
ePlotAreaWidth=50;
eXAxisNorthVisible=0;
eYAxisEastVisible=0;
[xb yb]=ebar(data,0);

ePlotTitleText='Bar Plot 1';
ePlotAreaPos=[20 20];
eYAxisWestScale=[0 0 200];
eXAxisSouthScale=[0.5 0 6.5];
eYAxisWestLabelText='files';
eXAxisSouthLabelText='tool';

eplot(xb+0.05,yb+1,'',-1,[0 0 0])
eplot(xb,yb,'',-1,[0.9 0.9 0])
eplot(xb,yb,'',0,[0 0 0])
eplot

ePlotTitleText='Bar Plot 2';
ePlotAreaPos=[110 20];
eXAxisSouthScale=[0 0 200];
eYAxisWestScale=[0.5 0 6.5];
```

```
eXAxisSouthLabelText='files';
eYAxisWestLabelText='tool';
[xb yb]=ebar(data,0);
eplot(yb+1,xb+0.05,'',-1,[0 0 0])
eplot(yb,xb,'',-1,[0.9 0.0 0])
eplot(yb,xb,'',0,[0 0 0])
eplot


eclose
eview
```

A.1.11 edemo11.m



epsTk News

version 2.0

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Econometrics with Octave

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Summary
GNU Octave is an open-source implementation of a (mostly Matlab compatible) high-level languagefor numerical computations. This review briefly introduces Octave, discusses applications of Octave in an econometric context, and illustrates how to extend Octave with user-supplied C++ code.Several examples are provided.

Introduction
Econometricians sweat linear algebra. Be it for linear or non-linear problems of estimation or inference, matrix algebra is a natural way of expressing these problems on paper. However, when it comes to writing computer programs to either implement tried and tested econometric procedures, or to research and prototype new routines, programming languages such as C or Fortran are more of a burden than an aid. Having to enhance the language by supplying functions for even the most primitive operations such as transposing a matrix adds extra programming effort, introduces new points of failure, and moves the level of abstraction further away from the elegant mathematical expressions. As Eddelbüttel (1996) argues, object-oriented programming provides 'a step up' from Fortran or C by enabling the programmer to seamlessly add new data types such as matrices, along with operations on these new data types, to the language. But with Moore's Law still being validated by ever and ever faster processors, and, hence, ever increasing computational power, the prime reason for using compiled code, i.e. speed, becomes less relevant. Hence the growing popularity of interpreted programming languages, both, in general, as witnessed by the surge in popularity of the generalpurpose programming languages Perl and Python and, in particular, for numerical applications with strong emphasis on matrix calculus where languages such as Gauss, Matlab, Ox, R, Splus, which were reviewed by Cribari-Neto and Jensen (1997), Cribari-Neto (1997) and Cribari-Neto and Zarkos (1999), have become popular. This article introduces another interpreted language focussed on numerical applications: Octave.

Octave is a program, as well as a programming language, for doing numerical work in a convenient yet expressive and powerful fashion. Octave was written primarily by John W. Eaton of the University of Wisconsin-Madison with various smaller contributions from other programmers across the Internet. The history of Octave can be traced back (as far as 1988) to the idea of providing companion software
for a textbook in chemical engineering, written by two researchers from the University of WisconsinMadison and the University of Texas. Full-time development for Octave began in the spring of 1992.

Version 1.0 was released in February of 1994, and version 2.0 followed in January of 1997. Octave is part of the GNU project (which is on the Web at http://www.gnu.org) and released under the GNU General Public License (GPL). It can therefore be used, studied, extended or simply copied just like any other Free Software program.

Econometricians might want to employ Octave for a variety of applications as it provides a convenient tool for interactive work which can range from simple applications to ad hoc simulations. The user interface, i.e. the Octave shell, is flexible and powerful. The rich set of mathematical operators and functions make Octave a very good prototyping and programming platform, or data pre- and postprocessing application. As Octave can be extended with new C, C++ or Fortran code that runs at the speed of compiled code, it is a good building block for Monte Carlo simulations. Octave is very similar to Matlab, and to a lesser extent to Gauss. However, both of these are commercial 'closed source' programs whereas Octave, as noted above, is distributed under the GNU GPL.
...
Octave also contains plotting commands which are implemented as wrappers around the external Gnuplot program. These commands include a generic plot command for plotting one or several series, as well as commands for plotting histograms and bar charts. All of these can be annotated, and it is possible to have several plot windows open at the same time (which requires a Gnuplot binary more recent than the 3.5 releases). The Octave plot commands are very convenient, but clearly not as complete as the Matlab plotting functions and hence might not satisfy all needs for publication-quality graphs. However, add-on packages have been provided by Octave users. Debian GNU/Linux provides additional graphics packages such as octave-plplot, an Octave interface to the PLPlot program, and

octave-epstk, a package for the direct creation of encapsulated postscript graphs.
...

M-Files of epsTk

eaxes.m eaxespol.m eaxis.m ebar.m ebitmap.m ebright.m ecdcover.m echrcode.m eclip.m eclippol.m eclose.m ecolors.m econtour.m econtra.m edemo1.m edemo2.m edemo3.m edemo4.m edemo5.m edemo6.m edemo7.m edemo8.m edemo9.m edemo10.m edemo11.m edemo12.m edemo13.m edemo14.m edsymbol.m eellipse.m eellipxy.m eerrbar.m efillmat.m eframe.m eglobpar.m egradient.m egrid.m egridcl.m egridlog.m egridpa.m egridpol.m egridpr.m egridxy.m ehead.m eidx2rgb.m eimage.m eimagesc.m eimagexy.m eimgleg.m eimgread.m eimgrot.m eimgview.m eimgwrit.m einit.m eimseps.m eisoline.m ejpg2eps.m ejpglist.m ejpgread.m elabel.m elineip.m elines.m eopen.m eparam.m epie.m epiesxy.m epline.m eplo2win.m eplot.m eplotlg.m epolar.m epolari.m epolaris.m epolplof.m epolplos.m epolplot.m eppmread.m eppmwrit.m eptitle.m equiver.m erect.m erectrc.m erencode.m erespar.m ergb2idx.m esavpar.m escalecl.m escalelog.m escalepa.m escalexy.m eshadoi.m eshadois.m eshadoix.m eshadow.m esubeps.m esymbol.m etabdef.m etabgrid.m etabtext.m etext.m etextxy.m eticdis.m etitle.m etx2box.m etxtbox.m etxtlpos.m etxtread.m etxtwrit.m eusage.m eview.m ewinsize.m exyline.m exyplot.m exyplotc.m exyplotf.m exyploti.m exyplots.m

New feature of 2.0

- log scaled axes
- return long tic positions
- new image functions e.g. ebright, econtra, ...
- text functions etxtbox, etxtread, etxtlpos
- pie plot and error bars
- linear interpolation with elineip and efillmat
- frames, circles, ellipses
- ASCII85 bitmap code, generates small EPS-files
- JPEG-file integration
- a lot of bugs removed

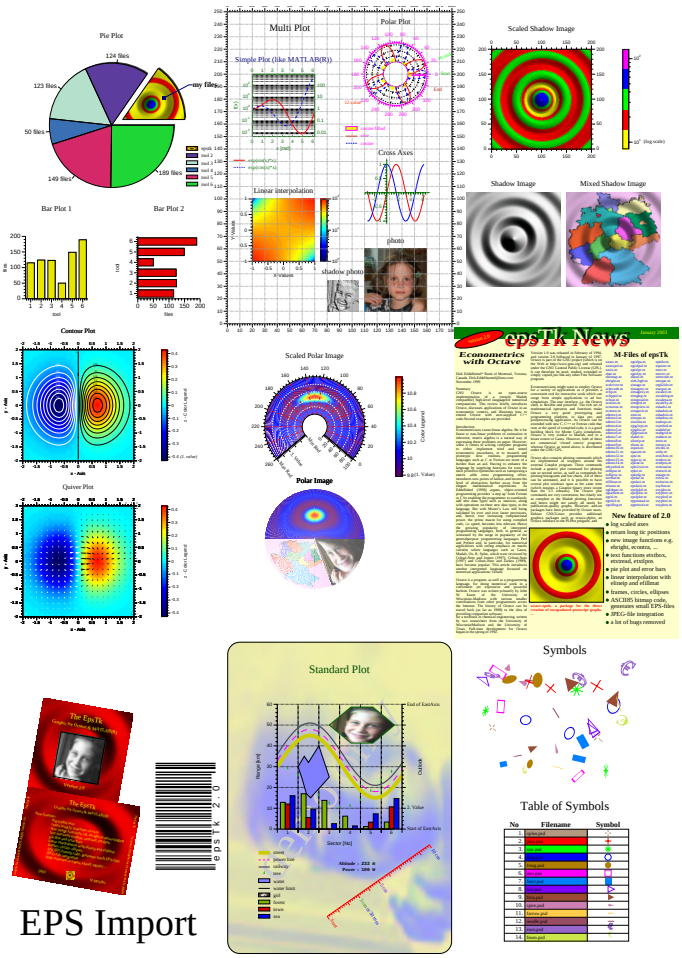
```
bgcolor=[1 1 0.8];
eopen('demo11.eps');
eglobpar

% head
%eWinGridVisible=1;
w=eWinWidth;
fs=20;
x=0;
```

```
h=fs/2;y=eWinHeight-h;
text='epsTk News';
eframe(x,y,w,h,0,-1,[0.0 0.5 0.0]); %background
etxtbox(text,x,y,w,h,[fs fs 10],0,1,0,[0 0 0],[1 1]); %shadow text
etxtbox(text,x,y,w,h,[fs],0,1,0,bgcolor); %main text
etext('January 2003',160,y+h/2,4,3,1,0,[1 1 0]); %text
h=h*0.8;y=y-h;
eframe(x,y,w,h,0,-1,bgcolor); %background
etxtbox(text,x,y,w,h,[fs fs 10],0,1,0,[0 0 0],[1 1+fs/2]); %shadow text
etxtbox(text,x,y,w,h,fs,0,1,0,[1 0 0],[0 fs/2]); % main text
yHead=y;
eframe(0,0,eWinWidth,yHead,0,-1,bgcolor); %background of ellipse
eellipse(x+20,y+h,40,10,0,-1,[1 0 0],15); %fill ellipse
eellipse(x+20,y+h,40,10,0,0,[0 0 0],15);  %border of ellipse
etext('version 2.0',x+20,y+h,4,3,1,15,[1 1 0]); %text

% text
eTextBoxSpaceWest=1.5;
eTextBoxSpaceEast=1.5;
eTextBoxSpaceNorth=1.5;
w=eWinWidth/3;
h=17;y=y-h;
fs=6;
text='Econometrics with Octave';
etxtbox(text,x,y,w,h,[fs*1.5 fs 10],0,3,0,[0 0 0]); %title

rText=etxtread([ePath 'octave.asc']); %get text from file
h=y;y=y-h;
fs=3;
endKey='Version 1.0';
pos=findstr(rText,endKey);
text=rText(1:pos(1)-1);
rText=rText(pos(1):length(rText));
etxtbox(text,x,y,w,h,fs,2,1,0,[0 0 0]); %1. column of text

x=x+w;
h=143;y=yHead-h;
endKey='octave-epstk';
pos=findstr(rText,endKey);
text=rText(1:pos(1)-1);
rText=rText(pos(1):length(rText));
etxtbox(text,x,y,w,h,fs,2,1,0,[0 0 0]); %2. column of text

[im cm]=eshadois;
h=w;y=y-h;
eframe(x,y,w,w,0.5,im,cm); % insert epstk logo
eframe(x,y,w,w,0.5,0,[0 0 0]); %frame

h=50;y=y-h;
text=rText;
etxtbox(text,x,y,w,h,fs,2,3,0,[1 0 0]); % last part of text

% filelist
fs=6;
```

```
x=x+w;
h=eTextBoxSpaceNorth+fs+eTextBoxSpaceSouth;y=yHead-h;
text='M-Files of epsTk';
etxtbox(text,x,y,w,h,fs,0,3,0,[0 0 0]); %title
text=etxtread([ePath 'mFileList']);
[tPos n]=etxtlpos(text);
nRows=ceil(n/3);
fs=3;
h=eTextBoxSpaceNorth+nRows*fs+eTextBoxSpaceSouth;y=y-h;
cx=x;
cText=text(tPos(1,1):tPos(nRows,2));
etxtbox(cText,cx,y,w/3,h,fs,2,1,0,[0 0 1]); %1. column
cx=x+w/3;
cText=text(tPos(nRows+1,1):tPos(2*nRows,2));
etxtbox(cText,cx,y,w/3,h,fs,2,1,0,[0 0 1]); %2. column
cx=x+2*w/3;
cText=text(tPos(2*nRows+1,1):tPos(n,2));
etxtbox(cText,cx,y,w/3,h,fs,2,1,0,[0 0 1]); %3. column

% feature list
y=y-fs;
fs=6;
h=eTextBoxSpaceNorth+fs+eTextBoxSpaceSouth;y=y-h;
text='New feature of 2.0';
etxtbox(text,x,y,w,h,fs,0,3,0,[0 0 0]); %title

fs=5;
font=1;
dotSize=fs/2;
iDotX=x+eTextBoxSpaceWest+dotSize/2;
iDotShift=eTextBoxSpaceNorth+fs/2;
iTxtX=iDotX+dotSize/2;
iw=w-iTxtX+x;
edsymbol('dot','fring.psd',dotSize/10,dotSize/10,0,0,0,[0 0.3 0]);

rows=1;h=eTextBoxSpaceNorth+rows*fs+eTextBoxSpaceSouth;y=y-h;
esymbol(iDotX,y+h-iDotShift,'dot');
text='log scaled axes';
etxtbox(text,iTxtX,y,iw,h,fs,1,font,0,[0 0 0]); %feature list item

rows=1;h=eTextBoxSpaceNorth+rows*fs+eTextBoxSpaceSouth;y=y-h;
esymbol(iDotX,y+h-iDotShift,'dot');
text='return long tic positions of axes';
etxtbox(text,iTxtX,y,iw,h,fs,1,font,0,[0 0 0]); %feature list item

rows=2;h=eTextBoxSpaceNorth+rows*fs+eTextBoxSpaceSouth;y=y-h;
esymbol(iDotX,y+h-iDotShift,'dot');
text='new image functions e.g. ebright, econtra, ...';
etxtbox(text,iTxtX,y,iw,h,fs,1,font,0,[0 0 0]); %feature list item

rows=2;h=eTextBoxSpaceNorth+rows*fs+eTextBoxSpaceSouth;y=y-h;
esymbol(iDotX,y+h-iDotShift,'dot');
text='text functions etxtbox, etxtread, etxtlpos';
etxtbox(text,iTxtX,y,iw,h,fs,1,font,0,[0 0 0]); %feature list item
```

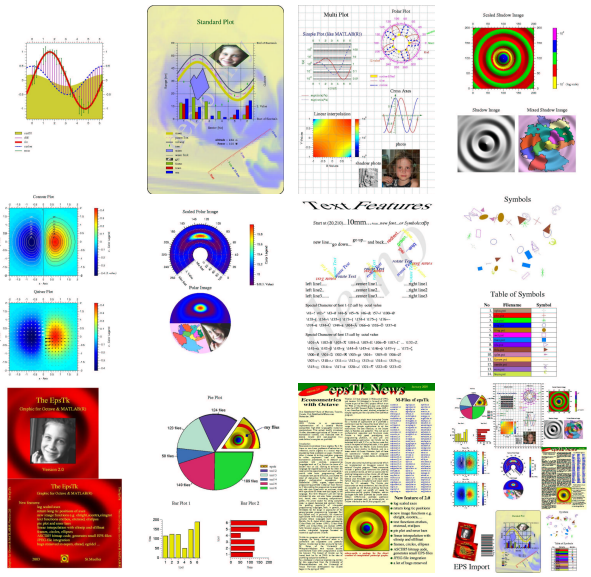
```
rows=1;h=eTextBoxSpaceNorth+rows*fs+eTextBoxSpaceSouth;y=y-h;
esymbol(iDotX,y+h-iDotShift,'dot');
text='pie plot and error bars';
etxtbox(text,iTxtX,y,iw,h,fs,1,font,0,[0 0 0]); %feature list item

rows=2;h=eTextBoxSpaceNorth+rows*fs+eTextBoxSpaceSouth;y=y-h;
esymbol(iDotX,y+h-iDotShift,'dot');
text='linear interpolation with elineip and efillmat';
etxtbox(text,iTxtX,y,iw,h,fs,1,font,0,[0 0 0]); %feature list item

rows=1;h=eTextBoxSpaceNorth+rows*fs+eTextBoxSpaceSouth;y=y-h;
esymbol(iDotX,y+h-iDotShift,'dot');
text='frames, circles, ellipses';
etxtbox(text,iTxtX,y,iw,h,fs,1,font,0,[0 0 0]); %feature list item

rows=2;h=eTextBoxSpaceNorth+rows*fs+eTextBoxSpaceSouth;y=y-h;
esymbol(iDotX,y+h-iDotShift,'dot');
text='ASCII85 bitmap code, generates small EPS-files';
etxtbox(text,iTxtX,y,iw,h,fs,1,font,0,[0 0 0]); %feature list item

rows=1;h=eTextBoxSpaceNorth+rows*fs+eTextBoxSpaceSouth;y=y-h;
esymbol(iDotX,y+h-iDotShift,'dot');
text='JPEG-file integration';
etxtbox(text,iTxtX,y,iw,h,fs,1,font,0,[0 0 0]); %feature list item

rows=1;h=eTextBoxSpaceNorth+rows*fs+eTextBoxSpaceSouth;y=y-h;
esymbol(iDotX,y+h-iDotShift,'dot');
text='a lot of bugs removed';
etxtbox(text,iTxtX,y,iw,h,fs,1,font,0,[0 0 0]); %feature list item
eclose
eview
```

A.1.12 edemo12.m




```
eopen('demo12.eps')                          % open eps-file and write eps-head

eglobpar                                     % get access to global parameters
etext('EPS Import',5,5,10,1)

esubeps(3,3,1,1,'demo10.eps');
esubeps(3,3,1,2,'demo3.eps');
esubeps(3,3,1,3,'demo4.eps');
esubeps(3,3,2,1,'demo5.eps');
esubeps(3,3,2,2,'demo6.eps');
esubeps(3,3,2,3,'demo11.eps');
einseps(0,20,'demo9.eps',0.2,0.2,-10);
einseps(60,20,[ePath 'epstkbc'],0.6,0.6,90); % file generated by GNU barcode
esubeps(3,3,3,2,'demo2.eps');
esubeps(3,3,3,3,'demo8.eps');
eclose                                       % close eps-file
eview                                        % start ghostview with eps-file
```

A.1.13 edemo13.m

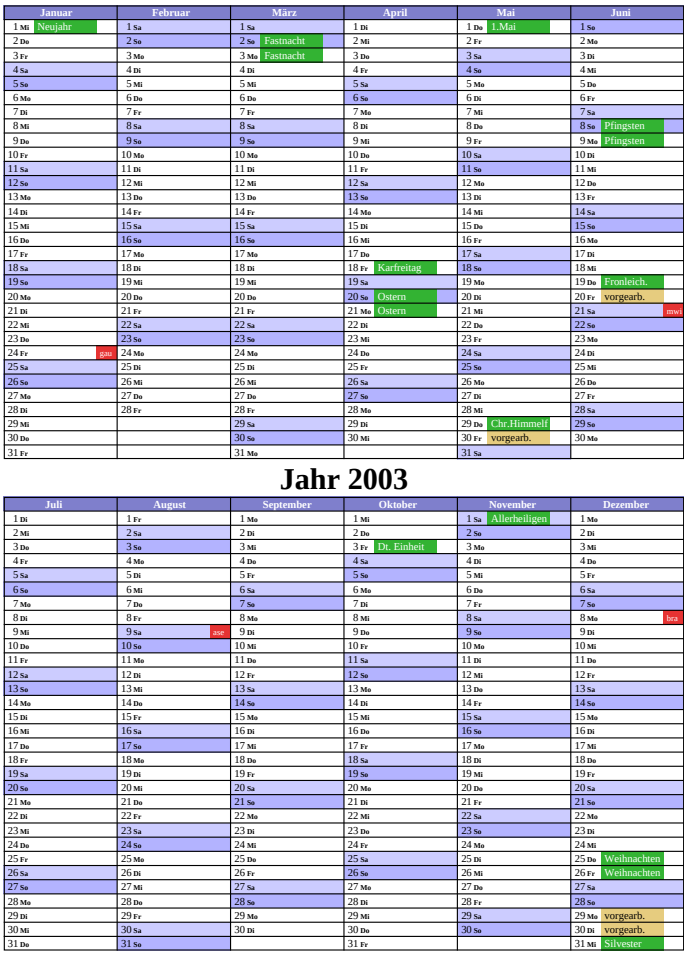


demo1.jpg demo2.jpg demo3.jpg demo4.jpg
demo5.jpg demo6.jpg demo7.jpg demo8.jpg
demo9.jpg demo10.jpg demo11.jpg demo12.jpg

```
% create a image list with ejpglist()
eglobpar
einit

% read  eps file list
list=etxtread([ePath 'epsFileList']);
jList=' ';
[lPos n]=etxtlpos(list);

% make jpeg-files and a list of jpeg-files
for i=1:n
  eFileName=list(lPos(i,1):lPos(i,2));
  if exist(eFileName)
    jFileName=ebitmap(1,100); % eps-file to jpeg-file
    jList=[jList jFileName eTextLimitPara];
  end
end
jList=jList(2:size(jList,2));
etxtwrit(jList,'demo_jFileList');

% create image list by ejpglist()
ejpglist('demo_jFileList',[50 40],0,'demo13');
```

```
eview
```

A.1.14 edemo14.m



Januar	Februar	März	April	Mai	Juni
1 Mi Neujahr	1 Sa	1 Sa	1 Di	1 Do 1.Mai	1 So
2 Do	2 So	2 So Fastnacht	2 Mi	2 Fr	2 Mo
3 Fr	3 Mo	3 Mo Fastnacht	3 Do	3 Sa	3 Di
4 Sa	4 Di	4 Di	4 Fr	4 So	4 Mi
5 So	5 Mi	5 Mi	5 Sa	5 Mo	5 Do
6 Mo	6 Do	6 Do	6 So	6 Di	6 Fr
7 Di	7 Fr	7 Fr	7 Mo	7 Mi	7 Sa
8 Mi	8 Sa	8 Sa	8 Di	8 Do	8 So Pfingsten
9 Do	9 So	9 So	9 Mi	9 Fr	9 Mo Pfingsten
10 Fr	10 Mo	10 Mo	10 Do	10 Sa	10 Di
11 Sa	11 Di	11 Di	11 Fr	11 So	11 Mi
12 So	12 Mi	12 Mi	12 Sa	12 Mo	12 Do
13 Mo	13 Do	13 Do	13 So	13 Di	13 Fr
14 Di	14 Fr	14 Fr	14 Mo	14 Mi	14 Sa
15 Mi	15 Sa	15 Sa	15 Di	15 Do	15 So
16 Do	16 So	16 So	16 Mi	16 Fr	16 Mo
17 Fr	17 Mo	17 Mo	17 Do	17 Sa	17 Di
18 Sa	18 Di	18 Di	18 Fr Karfreitag	18 So	18 Mi
19 So	19 Mi	19 Mi	19 Sa	19 Mo	19 Do Fronleich.
20 Mo	20 Do	20 Do	20 So Ostern	20 Di	20 Fr vorgearb.
21 Di	21 Fr	21 Fr	21 Mo Ostern	21 Mi	21 Sa mwi
22 Mi	22 Sa	22 Sa	22 Di	22 Do	22 So
23 Do	23 So	23 So	23 Mi	23 Fr	23 Mo
24 Fr gau	24 Mo	24 Mo	24 Do	24 Sa	24 Di
25 Sa	25 Di	25 Di	25 Fr	25 So	25 Mi
26 So	26 Mi	26 Mi	26 Sa	26 Mo	26 Do
27 Mo	27 Do	27 Do	27 So	27 Di	27 Fr
28 Di	28 Fr	28 Fr	28 Mo	28 Mi	28 Sa
29 Mi		29 Sa	29 Di	29 Do Chr.Himmelf	29 So
30 Do		30 So	30 Mi	30 Fr vorgearb.	30 Mo
31 Fr		31 Mo		31 Sa	

Jahr 2003

Juli	August	September	Oktober	November	Dezember
1 Di	1 Fr	1 Mo	1 Mi	1 Sa Allerheiligen	1 Mo
2 Mi	2 Sa	2 Di	2 Do	2 So	2 Di
3 Do	3 So	3 Mi	3 Fr Dt. Einheit	3 Mo	3 Mi
4 Fr	4 Mo	4 Do	4 Sa	4 Di	4 Do
5 Sa	5 Di	5 Fr	5 So	5 Mi	5 Fr
6 So	6 Mi	6 Sa	6 Mo	6 Do	6 Sa
7 Mo	7 Do	7 So	7 Di	7 Fr	7 So
8 Di	8 Fr	8 Mo	8 Mi	8 Sa	8 Mo bra
9 Mi	9 Sa asp	9 Di	9 Do	9 So	9 Di
10 Do	10 So	10 Mi	10 Fr	10 Mo	10 Mi
11 Fr	11 Mo	11 Do	11 Sa	11 Di	11 Do
12 Sa	12 Di	12 Fr	12 So	12 Mi	12 Fr
13 So	13 Mi	13 Sa	13 Mo	13 Do	13 Sa
14 Mo	14 Do	14 So	14 Di	14 Fr	14 So
15 Di	15 Fr	15 Mo	15 Mi	15 Sa	15 Mo
16 Mi	16 Sa	16 Di	16 Do	16 So	16 Di
17 Do	17 So	17 Mi	17 Fr	17 Mo	17 Mi
18 Fr	18 Mo	18 Do	18 Sa	18 Di	18 Do
19 Sa	19 Di	19 Fr	19 So	19 Mi	19 Fr
20 So	20 Mi	20 Sa	20 Mo	20 Do	20 Sa
21 Mo	21 Do	21 So	21 Di	21 Fr	21 So
22 Di	22 Fr	22 Mo	22 Mi	22 Sa	22 Mo
23 Mi	23 Sa	23 Di	23 Do	23 So	23 Di
24 Do	24 So	24 Mi	24 Fr	24 Mo	24 Mi
25 Fr	25 Mo	25 Do	25 Sa	25 Di	25 Do Weihnachten
26 Sa	26 Di	26 Fr	26 So	26 Mi	26 Fr Weihnachten
27 So	27 Mi	27 Sa	27 Mo	27 Do	27 Sa
28 Mo	28 Do	28 So	28 Di	28 Fr	28 So
29 Di	29 Fr	29 Mo	29 Mi	29 Sa	29 Mo vorgearb.
30 Mi	30 Sa	30 Di	30 Do	30 So	30 Di vorgearb.
31 Do	31 So		31 Fr		31 Mi Silvester

```
%%  edemo10 - print calendar of a year
%%
%%
% written by Coletta Schumacher and Stefan Mueller
year=2003;
%               day   month  textIndex textColumn textColor    backgroundColor
myHolidays=   [
                24     1      21         2          1.0 1.0 1.0  0.9 0.2 0.2;
                 9     8      31         2          1.0 1.0 1.0  0.9 0.2 0.2;
                 8    12      41         2          1.0 1.0 1.0  0.9 0.2 0.2;
                21     6      50         2          1.0 1.0 1.0  0.9 0.2 0.2;
                30     5      80         1          0.0 0.0 0.0  0.9 0.8 0.5;
                20     6      80         1          0.0 0.0 0.0  0.9 0.8 0.5;
                29    12      80         1          0.0 0.0 0.0  0.9 0.8 0.5;
                30    12      80         1          0.0 0.0 0.0  0.9 0.8 0.5;
              ];
myHoliText=   [
               '021gau          ';
               '031ase          ';
```

```
              '041bra          ';
              '050mwi          ';
              '080vorgearb.    ';
             ];
%variable holydays
%              day   month  textIndex textColumn textColor    backgroundColor
varHolidays=  [
                0    0      1        1          1.0 1.0 1.0  0.2 0.7 0.2;
                1    0      1        1          1.0 1.0 1.0  0.2 0.7 0.2;
               47    0      3        1          1.0 1.0 1.0  0.2 0.7 0.2;
               49    0      4        1          1.0 1.0 1.0  0.2 0.7 0.2;
               50    0      5        1          1.0 1.0 1.0  0.2 0.7 0.2;
               88    0      6        1          1.0 1.0 1.0  0.2 0.7 0.2;
               98    0      7        1          1.0 1.0 1.0  0.2 0.7 0.2;
               99    0      7        1          1.0 1.0 1.0  0.2 0.7 0.2;
              109    0      9        1          1.0 1.0 1.0  0.2 0.7 0.2;
             ];
varHoliText=  [
              '001Fastnacht    ';
              '003Karfreitag   ';
              '004Ostern       ';
              '005Ostern       ';
              '006Chr.Himmelf .';
              '007Pfingsten    ';
              '009Fronleich.   ';
             ];
% fixed holidays
%              day   month  textIndex textColumn textColor    backgroundColor
fixHolidays=[
                1    1      10       1          1.0 1.0 1.0  0.2 0.7 0.2;
                1    5      11       1          1.0 1.0 1.0  0.2 0.7 0.2;
                3   10      12       1          1.0 1.0 1.0  0.2 0.7 0.2;
                1   11      13       1          1.0 1.0 1.0  0.2 0.7 0.2;
               25   12      14       1          1.0 1.0 1.0  0.2 0.7 0.2;
               26   12      14       1          1.0 1.0 1.0  0.2 0.7 0.2;
               31   12      16       1          1.0 1.0 1.0  0.2 0.7 0.2;
             ];
fixHoliText=[
              '010Neujahr      ';
              '0111.Mai        ';
              '012Dt. Einheit  ';
              '013Allerheiligen';
              '014Weihnachten  ';
              '016Silvester    ';
             ];
weekday= ['Mo'; 'Di'; 'Mi'; 'Do'; 'Fr'; 'Sa'; 'So'];
saBgColor=[0.8 0.8 1.0];
suBgColor=[0.7 0.7 1.0];
monthT=['Januar   '; 'Februar  '; 'M\\344rz '; 'April    ';
        'Mai      '; 'Juni     '; 'Juli     '; 'August   ';
        'September'; 'Oktober  '; 'November '; 'Dezember '];
nDaysOfM = [31 28 31 30 31 30 31 31 30 31 30 31];
if ~rem (year,4),nDaysOfM(2)=29;end
nDaysOfY=sum(nDaysOfM);
```

```
% sundays of carneval until 2019
cSundays=[ 5 3;25 2;10 2; 2 3;22 2; 6 2;26 2;18 2; 3 2;22 2;...
          14 2; 6 3;19 2;10 2; 2 3;15 2; 7 2;26 2;11 2; 3 3];
cSunday=year-2000+1;
cDay=cSundays(cSunday,1);
cMonth=cSundays(cSunday,2);
dayOfY=rem(cDay+sum(nDaysOfM(1:cMonth-1)),7);
if dayOfY
  firstDayOfY=7-dayOfY+1;
else
  firstDayOfY=1;
end

% variable holidays   day of the
for k=1:size(varHolidays,1)
  varDay=cDay+varHolidays(k,1);
  for i=0:4
    if varDay>nDaysOfM(cMonth+i)
      varDay=varDay-nDaysOfM(cMonth+i);
    else
      break
    end
  end
  varHolidays(k,1)=varDay;
  varHolidays(k,2)=cMonth+i;
end

holidays=[myHolidays;varHolidays;fixHolidays];
holitext=[myHoliText;varHoliText;fixHoliText];
[nTextRows nTextCols]=size(holitext);
holiIndex=holidays(:,3);
for i=1:nTextRows
  index=str2num(holitext(i,1:3));
  fresult=find(holiIndex==index);
  holidays(fresult,3)=i*ones(size(fresult,1),1);
end
holitext=holitext(:,4:nTextCols);

% draw table
eopen('demo14.eps');
eglobpar
eWinGridVisible=0;
dayOfY=0;
[calX calY]=etabdef(32,6,0,130,180,120);
for month=1:12
  if month==7
    etabgrid(calX,calY);
    [calX calY]=etabdef(32,6,0,0,180,120);
  end
  tabCol=rem(month-1,6)+1;
  etabtext(calX,calY,1,tabCol,monthT(month,:),0,3,100,[1 1 1],[0.5 0.5 0.8]);
  offset=3.8;
  [dayX dayY]=etabdef(32,1,calX(tabCol,1)+offset,calY(32,1),1,120);
```

```
  [wdX wdY]=etabdef(32,1,calX(tabCol,1)+0.9*offset,calY(32,1),1,120);
  for dayOfM=1:nDaysOfM(month)
    dayOfW=rem(firstDayOfY-1+dayOfY,7)+1;
    dayOfY=dayOfY+1;
    if dayOfW==6
      etabtext(calX,calY,dayOfM+1,tabCol,'',1,1,100,[1 1 1],saBgColor);
    elseif dayOfW==7
      etabtext(calX,calY,dayOfM+1,tabCol,'',1,1,100,[1 1 1],suBgColor);
    end
    etabtext(dayX,dayY,dayOfM+1,1,sprintf('%d',dayOfM),-1);
    etabtext(wdX,wdY,dayOfM+1,1,sprintf('%s',weekday(dayOfW,:)),1,3,70);
  end
  offset=8;
  [nX nY]=etabdef(32,2,calX(tabCol,1)+offset,calY(32,1),...
                  calX(tabCol,2)-offset,120,[3 1]);
  for notes=find(holidays(:,2)==month)'
    if holidays(notes,4)==1
      etabtext(nX,nY,holidays(notes,1)+1,1,...
               sprintf('%s',holitext(holidays(notes,3),:)),...
               1,1,100,holidays(notes,5:7),holidays(notes,8:10));
    elseif holidays(notes,4)==2
      etabtext(nX,nY,holidays(notes,1)+1,2,...
               sprintf('%s',holitext(holidays(notes,3),:)),...
               1,1,80,holidays(notes,5:7),holidays(notes,8:10));
    end
  end
end
etabgrid(calX,calY);
etext(sprintf('Jahr %d',year),90,122,8,0,3);
eclose;
eview;
```

A.2 Character Code

Character Codes

Character codes of font 1-12 call by octal value

\0=	\1=	\2=	\3=	\4=	\5=	\6=	\7=	\10=	\11=	\12=	\13=	\14=	\15=	\16=
\17=	\20=	\21=	\22=	\23=	\24=	\25=	\26=	\27=	\30=	\31=	\32=	\33=	\34=	\35=
\36=	\37=	\40=	\41=!	\42="	\43=#	\44=$	\45=%	\46=&	\47='	\50=(	\51=)	\52=*	\53=+	\54=,
\55=–	\56=.	\57=/	\60=0	\61=1	\62=2	\63=3	\64=4	\65=5	\66=6	\67=7	\70=8	\71=9	\72=:	\73=;
\74=<	\75==	\76=>	\77=?	\100=@	\101=A	\102=B	\103=C	\104=D	\105=E	\106=F	\107=G	\110=H	\111=I	\112=J
\113=K	\114=L	\115=M	\116=N	\117=O	\120=P	\121=Q	\122=R	\123=S	\124=T	\125=U	\126=V	\127=W	\130=X	\131=Y
\132=Z	\133=[	\134=\	\135=]	\136=^	\137=_	\140=‘	\141=a	\142=b	\143=c	\144=d	\145=e	\146=f	\147=g	\150=h
\151=i	\152=j	\153=k	\154=l	\155=m	\156=n	\157=o	\160=p	\161=q	\162=r	\163=s	\164=t	\165=u	\166=v	\167=w
\170=x	\171=y	\172=z	\173={	\174=|	\175=}	\176=~	\177=	\200=	\201=	\202=	\203=	\204=	\205=	\206=
\207=	\210=	\211=	\212=	\213=	\214=	\215=	\216=	\217=	\220=	\221=	\222=	\223=	\224=	\225=
\226=	\227=	\230=	\231=	\232=	\233=	\234=	\235=	\236=	\237=	\240=	\241=¡	\242=¢	\243=£	\244=⁄
\245=¥	\246=ƒ	\247=§	\250=¤	\251='	\252=“	\253=«	\254=‹	\255=›	\256=fi	\257=fl	\260=°	\261=–	\262=†	\263=‡
\264=·	\265=µ	\266=¶	\267=•	\270=‚	\271=„	\272=”	\273=»	\274=…	\275=‰	\276=¾	\277=¿	\300=À	\301=`	\302=´
\303=ˆ	\304=Ã	\305=¯	\306=˘	\307=˙	\310=¨	\311=É	\312=˚	\313=¸	\314=Ì	\315=˝	\316=˛	\317=ˇ	\320=—	\321=Ñ
\322=Ò	\323=Ó	\324=Ô	\325=Õ	\326=Ö	\327=×	\330=Ø	\331=Ù	\332=Ú	\333=Û	\334=Ü	\335=Ý	\336=Þ	\337=ß	\340=à
\341=Æ	\342=â	\343=ª	\344=ä	\345=å	\346=æ	\347=ç	\350=Ł	\351=Ø	\352=Œ	\353=º	\354=ì	\355=í	\356=î	\357=ï
\360=ð	\361=æ	\362=ò	\363=ó	\364=ô	\365=ı	\366=ö	\367=÷	\370=l	\371=ø	\372=œ	\373=ß	\374=ü	\375=ý	\376=þ

Character Codes of font 13 call by octal value

\0=	\1=	\2=	\3=	\4=	\5=	\6=	\7=	\10=	\11=	\12=	\13=	\14=	\15=	\16=
\17=	\20=	\21=	\22=	\23=	\24=	\25=	\26=	\27=	\30=	\31=	\32=	\33=	\34=	\35=
\36=	\37=	\40=	\41=!	\42=∀	\43=#	\44=∃	\45=%	\46=&	\47=∍	\50=(	\51=)	\52=*	\53=+	\54=,
\55=–	\56=.	\57=/	\60=0	\61=1	\62=2	\63=3	\64=4	\65=5	\66=6	\67=7	\70=8	\71=9	\72=:	\73=;
\74=<	\75==	\76=>	\77=?	\100=≅	\101=A	\102=B	\103=X	\104=Δ	\105=E	\106=Φ	\107=Γ	\110=H	\111=I	\112=ϑ
\113=K	\114=Λ	\115=M	\116=N	\117=O	\120=Π	\121=Θ	\122=P	\123=Σ	\124=T	\125=Y	\126=ς	\127=Ω	\130=Ξ	\131=Ψ
\132=Z	\133=[	\134=∴	\135=]	\136=⊥	\137=_	\140= ¯	\141=α	\142=β	\143=χ	\144=δ	\145=ε	\146=ϕ	\147=γ	\150=η
\151=ι	\152=φ	\153=κ	\154=λ	\155=μ	\156=ν	\157=ο	\160=π	\161=θ	\162=ρ	\163=σ	\164=τ	\165=υ	\166=ϖ	\167=ω
\170=ξ	\171=ψ	\172=ζ	\173={	\174=|	\175=}	\176=~	\177=	\200=	\201=	\202=	\203=	\204=	\205=	\206=
\207=	\210=	\211=	\212=	\213=	\214=	\215=	\216=	\217=	\220=	\221=	\222=	\223=	\224=	\225=
\226=	\227=	\230=	\231=	\232=	\233=	\234=	\235=	\236=	\237=	\240=€	\241=ϒ	\242=′	\243=≤	\244=⁄
\245=∞	\246=ƒ	\247=♣	\250=♦	\251=♥	\252=♠	\253=↔	\254=←	\255=↑	\256=→	\257=↓	\260=°	\261=±	\262=″	\263=≥
\264=×	\265=∝	\266=∂	\267=•	\270=÷	\271=≠	\272=≡	\273=≈	\274=…	\275=|	\276=—	\277=↵	\300=ℵ	\301=ℑ	\302=ℜ
\303=℘	\304=	\305=⊕	\306=∅	\307=∩	\310=∪	\311=⊃	\312=⊇	\313=⊄	\314=⊂	\315=⊆	\316=∈	\317=∉	\320=∠	\321=∇
\322=®	\323=©	\324=™	\325=∏	\326=	\327=·	\330=¬	\331=∧	\332=∨	\333=⇔	\334=	\335=⇑	\336=⇒	\337=	\340=◊
\341=〈	\342=®	\343=©	\344=	\345=∑	\346=⎛	\347=⎜	\350=⎝	\351=⎡	\352=⎢	\353=⎣	\354=⎧	\355=⎨	\356=⎩	\357=⎪
\360=	\361=〉	\362=⌡	\363=⌠	\364=⎮	\365=⌋	\366=	\367=⎮	\370=⌋	\371=⎤	\372=⎮	\373=⌋	\374=	\375=⎭	\376=⌋