A Comparison of Open Source Seismic Processing Software Packages

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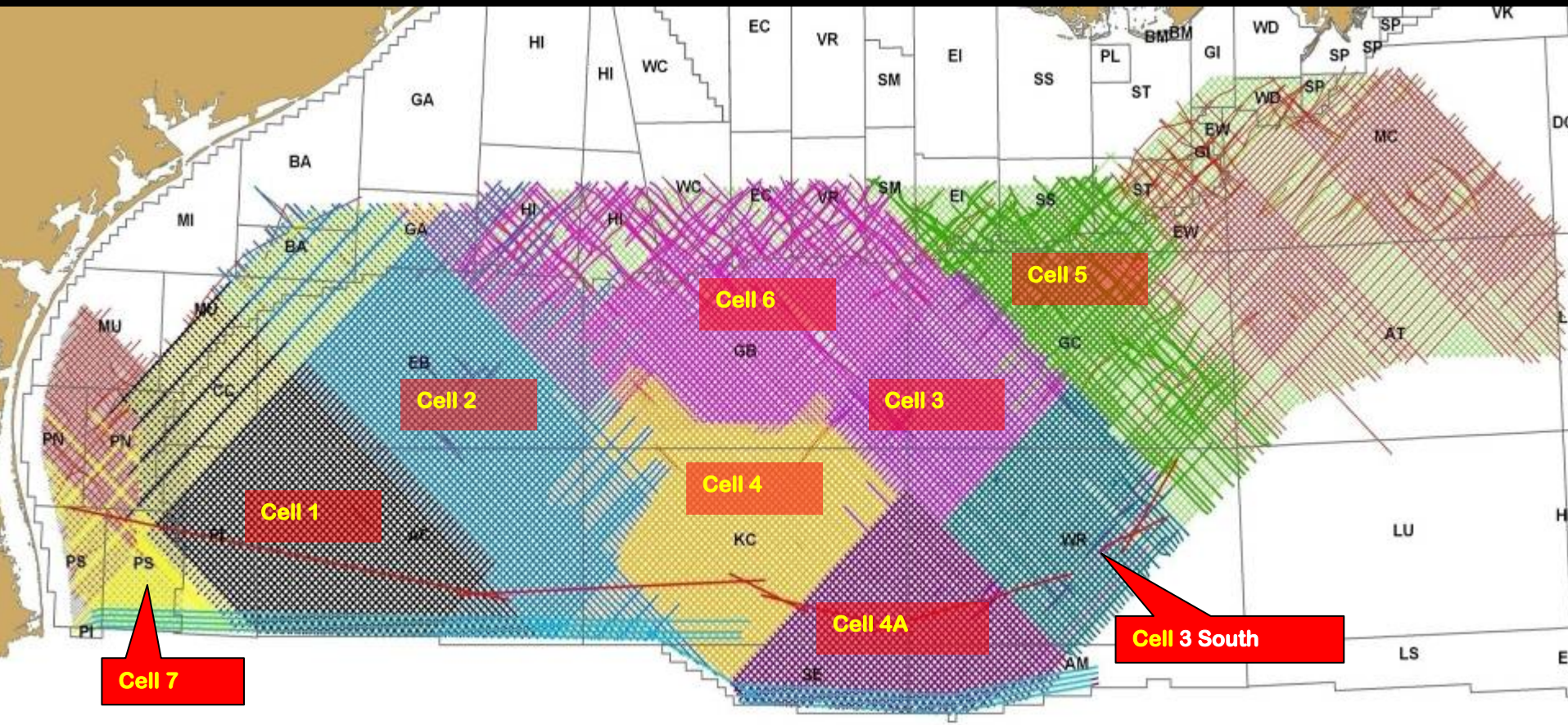
Reflection Seismic Package	Author
Madagascar	Sergey Fomel et al.
SEPlib	Stanford University
SU	Colorado School of Mines
FreeUSP, FreeDDS	Amoco, BP
Pseis	Randy Selzer
CPSeis	ConocoPhillips
SPARC	ARCO
BotoSeis	Williams Lima, Brazil
GEBR	Ricardo Biloti et al.
SeaSeis	Bjorn Olofsson
JavaSEIS	Chuck Moser

Reflection Seismic Package	Installations	Downloads
Madagascar	1100	+13,000
SEPlib	<100	
SU	3300	+17,000
FreeUSP, FreeDDS		
Pseis		
CPSeis		
SPARC		
BotoSeis		
GEBR		
SeaSeis		
JavaSEIS		40/month

Fugro MCS Deep Focus Program



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Data Format

- Madagascar, SEPlib: *.H, *.rsf files
  - ASCI header
  - n1= n2= n3= d1= d2= d3= o1= o2= o3=
  - in="file.bin"

- SU: su format file:
  - 240 bytes SEGY trace header and trace binary

Reflection Seismic Package	Language
Madagascar	C, Python
SEPlib	C, Python, Fortran, Ratfor, F90
SU	C
FreeUSP, FreeDDS	F77, C
Pseis	F77, C
CPSeis	F90, C++
SPARC	F77
BotoSeis	Java
GEBR	C
SeaSeis	C,C++, Java
JavaSEIS	Java, Eclipse

Reflection Seismic Package	Documentation
Madagascar	Poor
SEPlib	Very Good
SU	Best
FreeUSP, FreeDDS	
Pseis	
CPSeis	
SPARC	
BotoSeis	
GEBR	
SeaSeis	
JavaSEIS	

Madagascar AGC self-doc

```
NAME
        sfagc
DESCRIPTION
        Automatic gain control.
SYNOPSIS
        sfagc < in.rsf > out.rsf repeat=1 rect#=(125,1,1,...)
PARAMETERS
        int     rect#=(125,1,1,...)     smoothing radius on #-th axis
        int     repeat=1        repeat filtering several times
USED IN
        bei/dpmv/krchdmo
        bei/krch/wgkirch
        bei/vela/vscan
        data/sigsbee/ptest
        gee/pch/steep
        jsg/diffr/fault
        jsg/diffr/gom
        jsg/shape/beivc
        jsg/simistack/bei
        jsg/time2depth/masha2
        jsg/timelapse/duri
        rsf/usp/data
        sep/vc2/beivc
        sep/vc2/sigvc
SOURCE
        system/generic/Magc.c
```

SEPlib AGC self-doc

```
NAME
    Agc - Automatic gain control with first arrival detection

SYNOPSIS
    Agc window=200 detect=0 dwind=10 thresh=25. < in.H > out.H

INPUT  PARAMETERS
    window - integer
             [200]: length of the window in number of samples

    dwind - integer
              [10]: length of the detection window in number of samples

    detect - integer
              [0]:  detection off (Default value)    1:  detection on

    thresh - real
             [25.]: threshold (see comments below)

    n1,n2,n3,n4,n5,n6,n7 - integer
             standard seplib parameters

DESCRIPTION
    Gain program with first arrival detection

COMMENTS
          Agc gains seismic traces by normalizing each sample by the
          power of a window of samples surrounding that point.

          When the detect= is set to 1, agc is not applied on a trace
          until a first arrival is detected. The first arrival is
          detected when a moving dwind exceeds an initial dwind by a
          threshold factor.

EXAMPLE
          Agc < in.H window=200 detect=1 dwind=10 thresh=25. > out.H

          Applies agc on a trace based on a trace window of 200 samples.
          Agc is only applied after the first arrival has been detected
          using a detection window of 10 samples. The detection of the
          first arrival is based on an amplitude change between consecutive
          detection windows of 25%.

CATEGORY
    seis/filter
```

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SU AGC self-doc

```
SUGAIN - apply various types of gain to display traces

sugain <stdin >stdout [optional parameters]

Required parameters:
      none (no-op)

Optional parameters:
      panel=0         =1 gain whole data set (vs. trace by trace)
      tpow=0.0        multiply data by t^tpow
      epow=0.0        multiply data by exp(epow*t)
      gpow=1.0        take signed gpowth power of scaled data
      agc=0           flag; 1 = do automatic gain control
      gagc=0          flag; 1 = ... with gaussian taper
      wagc=0.5        agc window in seconds (use if agc=1 or gagc=1)
      trap=none       zero any value whose magnitude exceeds trapval
      clip=none       clip any value whose magnitude exceeds clipval
      pclip=none      clip any value greater than clipval
      nclip=none      clip any value less than  clipval
      qclip=1.0       clip by quantile on absolute values on trace
      qbal=0          flag; 1 = balance traces by qclip and scale
      pbal=0          flag; 1 = bal traces by dividing by rms value
      mbal=0          flag; 1 = bal traces by subtracting the mean
      maxbal=0        flag; 1 = balance traces by subtracting the max
      scale=1.0       multiply data by overall scale factor
      norm=0.0        divide data by overall scale factor
      bias=0.0        bias data by adding an overall bias value
      jon=0           flag; 1 means tpow=2, gpow=.5, qclip=.95
      verbose=0       verbose = 1 echoes info
      mark=0          apply gain only to traces with tr.mark=0
                      =1 apply gain only to traces with tr.mark!=0


       tmpdir=  if non-empty, use the value as a directory path
                prefix for storing temporary files; else if the
                the CWP_TMPDIR environment variable is set use
                its value for the path; else use tmpfile()

Operation order:
if (norm) scale/norm

out(t) = scale * BAL{CLIP[AGC{[t^tpow * exp(epow * t) * ( in(t)-bias )]^gpow}]}

Notes:
       The jon flag selects the parameter choices discussed in
       Claerbout's Imaging the Earth, pp 233-236.

       Extremely large/small values may be lost during agc. Windowing
       these off and applying a scale in a preliminary pass through
       sugain may help.

       Sugain only applies gain to traces with tr.mark=0. Use sushw,
       suchw, suedit, or suxedit to mark traces you do not want gained.
       See the selfdocs of sushw, suchw, suedit, and suxedit for more
       information about setting header fields. Use "sukeyword mark"
       for more information about the mark header field.
```

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Reflection Seismic Package	Number of modules
Madagascar	384
SEPlib	184
SU	395
FreeUSP, FreeDDS	
Pseis	
CPSeis	
SPARC	
BotoSeis	
GEBR	
SeaSeis	
JavaSEIS	

Madagascar

latex2wiki*
ppmpen*
pscons*
pspen*
scons*
scons-1.1.0*
sconsign*
sconsign-1.1.0*
scons-time*
scons-time-1.1.0*
sfabalance*
sfadd*
sfagc*
sfagmig*
sfai2refl*
sfaliasp*
sfattr*
sfautocorr*
sfawefd*
sfbandpass*
sfbin*
sfbin1*
sfboolcmp*
sfbox*
sfboxsmooth*
sfbyte*
sfbyte2jpg*
sfc2r*
sfcameron2d*
sfcanny*
sfcascade*
sfcat*
sfcausint*
sfcconjgrad*
sfcdottest*
sfcell2*
sfcgscan*
sfchebvc*
sfclip*
sfclip2*
sfcmatmult*
sfcmp2shot*
sfconjgrad*
sfcontour*
sfcontour3*
sfconv*
sfcosft*
sfcostaper*
sfcp*
sfcreate*
sfcube*
sfcubeplot*
sfcut*
sfdatstretch*
sfdd*
sfdeblur*
sfdecon*
sfdepth2time*
sfderiv*
sfdip*
sfdipfilter*
sfdisfil*
sfdix*
sfdixshape*
sfdmo*
sfdoc*
sfdots*
sfdottest*
sfeikonal*
sfeikonalvti*
sfenoint2*
sfenvelope*
sferf*
sfexgr*
sfexplanesignoi*
sfexpsignoi*
sfextract*
sffactorm*
sffactorn*
sffdct*
sffern*
sffft1*
sffft3*
sffiledims*
sffileflush*
sffincon*
sffinstack*
sffkamo*
sffkdmo*
sffocus*
sffourvc*
sffourvc2*
sfframe*
sfgazdag*
sfget*
sfgraph*
sfgraph3*
sfgrey*
sfgrey3*
sfhalfint*
sfhconv*
sfheaderattr*
sfheadercut*
sfheadermath*
sfheadersort*
sfheaderwindow*
sfheat*
sfheat3*
sfhelicon*
sfhistogram*
sfhole*
sfhwt2d*
sfhwtex*
sfic*
sfidempatch*
sfigrad*
sfimag*
sfimospray*
sfimpl2*
sfin*
sfinfill*
sfinmo*
sfintbin*
sfinterleave*
sfintshow*
sfinttest1*
sfinttest2*
sfinvbin*
sfinvbin1*
sfinvrec1*
sfiphase*
sfjitter*
sfjpg2byte*
sfkarman*
sfkarman2*
sfkill*
sfkilltraces*
sfkirchinv*
sfkirchnew*
sfkirmod*
sflapfill*
sfleftsize*
sflevint*
sflight*
sflinefit*
sflistminmax*
sflmostretch*
sflogstretch*
sflopef*
sflosignoi*
sflpad*
sflpef*
sflpf*
sflwefd*
sfmake*
sfmandelbrot*
sfmask*
sfmath*
sfmatmult*
sfmerge*
sfmig3*
sfmigsteep3*
sfminmax*
sfmisif*
sfmiss*
sfmiss1*
sfmonof*
sfmpi*
sfmsmiss*
sfmspef*
sfmutter*
sfmv*
sfnhelicon*
sfnmo*
sfnmostretch*
sfnoise*
sfnpef*
sfnsmooth1*
sfocparcel*
sfoctentwt*
sfofilp*
sfomp*
sfpad*
sfparcel*
sfpatch*
sfpclip*
sfpef*
sfpfactor2*
sfpick*
sfplanemis2*
sfplanemis3*
sfplanesignoi*
sfplas*
sfpldb*
sfplotrays*
sfplotrays3*
sfpmig*
sfpmshape2*
sfpnmo*
sfpostfilter2*
sfpp2psang2*
sfpp2pstsic*
sfpreconstkirch*
sfpredict*
sfprep4plot*
sfput*
sfpveltran*
sfpwd*
sfpwdix*
sfpwdsigk*
sfpwdsmooth2*
sfqdome*
sfquantile*
sfradial*
sfradon*
sfradstretch*
sfrays2*
sfrays2a*
sfrcat*
sfreal*
sfrefer*
sfreg2tri*
sfremap1*
sfreverse*
sfricker1*
sfrm*
sfrotate*
sfrtoc*
sfrweab*
sfrwezomig*
sfscale*
sfsegy2rsf*
sfsegyheader*
sfsegyread*
sfsegywrite*
sfseisigk*
sfseislet*
sfshapebin*
sfshapebin1*
sfshearer*
sfshoot2*
sfshot2cmp*
sfshotconstkirch*
sfshotholes*
sfshotprop*
sfsic3d*
sfsigmoid*
sfsignoi*
sfsimilarity*
sfsinc*
sfslant*
sfslice*
sfsmooth*
sfsmoothder*
sfsmoothreg*
sfsmoothreg2*
sfsort*
sfspectra*
sfspike*
sfspiral*
sfspline*
sfsplinebank*
sfsplinefilter*
sfsplineplane*
sfspray*
sfsrmig3*
sfsrmod3*
sfsrmva*
sfsrsyn*
sfstack*
sfstolt*
sfstolt2*
sfstoltstretch*
sfstretch*
sfsu2rsf*
sfsuread*
sfsuwrite*
sfsynmarine*
sft2chebstretch*
sft2stretch*
sftan2ang*
sftentwt*
sfthplot*
sfthr*
sfthreshold*
sftime2depth*
sftimecont*
sftlagtoang2d*
sftop*
sftour*
sftpow*
sftransp*
sftri2reg*
sftrirand*
sftrismooth2*
sftshift*
sftspline*
sftwodip2*
sftwofreq2*
sfunif2*
sfunif3*
sfunits*
sfve2d*
sfvelcon*
sfvelcon3*
sfvelmod*
sfveltran*
sfvoft*
sfvplotdiff*
sfvscan*
sfwarp1*
sfwarpadd*
sfwarpscan*
sfwdf*
sfwigb*
sfwiggle*
sfwilson*
sfwindow*
sfxcor*
sfxlagtoang2d*
sfzomig*
sfzomig3*
sfzomva*
vp7ab*
vpcmp*
vpcroshyp*
vpcsp*
vpdc*
vpdcretard*
vpellipse*
vpfrancis*
vpheadray*
vphyplay*
vplot2avi*
vplot2eps*
vplot2gif*
vplot2png*
vpnmotraj*
vppen*
vpreflector*
vpreflexpt*
vpreflkine*
vpsg*
vpvrms*
vpwhitepruf*
xtpen*

SEPlib

```
./              cmsawf.awk*     FMeikonal*      Infill3d@       Miss*           pstexpen*       Scat@           Stack@          vp_annotate*
../             Conj@           Fold3d*         Interleave*     MTTmaps*        pstogif*        Scat3d*         Stack3d*        vplot2gif*
Actify*         Contour*        Ft3d*           Interp*         Mute*           Radial*         Scatter3d*      Stretch*        vplot2mpeg*
Add@            Cp@             Ftplot*         Iso2d*          Mute3d*         Radnmo*         Scp@            Stube*          vplot2ras*
Agc*            Cp3d@           fullpath*       key-word*       Mv@             Rasterize*      Scp3d*          Surface*        vp_Movie*
Aniso2d*        Create3d*       Fx2d*           Kirch_2d_depth* Mv3d@           ratfor77*       Sdd*            Svppen*         vp_Overlay*
arithpar*       CreateSSH*      Gauss*          Kirmod3d*       NMO*            ratfor90*       Sdip*           Sxtpen*         vp_OverUnderAniso*
atoF*           Cubeplot*       Get*            latex2dvi*      Nmo3d*          ratsep*         Seis_vel*       Synch3d*        vp_OverUnderIso*
Attr*           Dd@             Gfgradz*        latex2pdf*      Noise*          Real@           sep_doc_it*     Ta2vplot*       vppen*
Attr3dhead*     Dip*            Gpow@           Latify*         not_found*      Reshape*        shortfort*      Taplot*         Vppen@
Balance*        Dip_azim*       Graph*          Lex.fort*       OFF2ANG*        Reverse*        Sls*            Thplot*         vp_SideBySideAniso*
Bandpass*       Dipintegrator*  Grey*           Lloyd_vel*      Operplot*       Rickmovie*      Smooth*         Tpow*           vp_SideBySideIso*
Box*            Dis3dhead*      Grid_fold@      LMO*            Overlay*        Rm@             Smv@            Transf*         vp_Unrotate*
Byte@           Disfil*         Halfint*        Log*            Pad*            Rm3d@           Smv3d*          Transf_fftw*    Vslan*
Byte2mpeg*      Dots*           Headermath*     lop2f90*        Patch*          Rtm2d*          Snoop*          Transp*         Wavelet*
Cabs@           Edit*           Helicon*        Ls@             Pef*            Rtoc@           Solver_ops*     Trcamp*         Wiggle*
Cabs2@          Energy*         Histogram*      Makedepend*     Phase*          sat*            Sort3d*         tube*           Window*
Cadd@           Envelope*       Hwt2d*          makefont*       plas*           sat.awk*        Spectra*        Tube@           Window3d*
CAM*            ExtractPOD*     Hwt3d*          Marine_geom3d*  pldb*           sat.fort*       Spike*          Txdec*          Window_key*
Cat@            Fdmod*          Hypint*         Math*           Pmpen@          saw*            spp*            Unmo*           xtpen*
Cat3d@          FFT5D*          Hypmovie*       Math_base*      pod2text*       saw.awk*        Sppmpen*        Vconvert*       Xtpen@
Cfft*           fgrep3*         Hypsum*         MCvfit*         Pow@            sawf*           Spspen*         Vel*            Zero*
Clip*           files           Imag@           Median*         ppmpen*         sawf90*         Srm@            Velan*
Cmplx@          Filter*         In@             Merge*          pspen*          sawf90.awk*     SRM*            Velan3d*
cmsawf*         Flatten*        In3d*           Merge_field*    Pspen@          Scale@          Srm3d*          v_f90*
```

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SU

```
./              isatty*         recast*         sucommand*      sugoupillaudpo* sumigtopo2d*    surandspike*    suttoz*         triseis*
../             kaperture*      recip*          suconv*         suharlan*       sumix*          surandstat*     sutvband*       triso*
a2b*            las2su*         refRealAziHTI*  sucountkey*     suhelp*         sumixgathers*   surange*        sutxtaper*      trisoplot*
argv*           lcmap*          refRealVTI*     sucvs4fowler*   suhilb*         sumute*         surecip*        suunpack1*      triview*
b2a*            linrort*        regrid3*        sucwt*          suhistogram*    suname*         sureduce*       suunpack2*      tvnmoqc*
bhedtopar*      lookpar*        replace*        sudatumfd*      suhrot*         sunan*          surefcon*       suutm*          unglitch*
cellauto*       lorenz*         resamp*         sudatumk2dr*    suhtmath*       sunhmospike*    sureflpsvsh*    suvcat*         uni2tri*
copyright*      lprop*          rmaxdiff*       sudatumk2ds*    suifft*         sunmo*          surelan*        suvel2df*       unif2*
cpall*          makevel*        scmap*          sudiff*         suilog*         sunormalize*    surelanan*      suvelan*        unif2aniso*
cshot1*         maxdiff*        segyclean*      sudipdivcor*    suimp2d*        sunull*         suresamp*       suvelan_nccs*   unisam*
cshot2*         maxints*        segyhdrmod*     sudipfilt*      suimp3d*        suocext*        suresstat*      suvelan_nsel*   unisam2*
cshotplot*      merge2*         segyhdrs*       sudivcor*       suimpedance*    suoldtonew*     susehw*         suvelan_uccs*   updatedoc*
ctrlstrip*      merge2v*        segyread*       sudivstack*     suinterp*       suop*           sushape*        suvelan_usel*   updatedocall*
cwell*          merge4*         segywrite*      sudmofk*        suinterpfowler* suop2*          sushift*        suvibro*        updatehead*
cwpfind*        mkparfile*      setbhed*        sudmofkcw*      suintvel*       supack1*        sushw*          suvlength*      upfort*
cxzco*          mrafxzwt*       smooth2*        sudmotivz*      suinvvxzco*     supack2*        susort*         suwaveform*     usernames*
cxzcs*          newcase*        smooth3d*       sudmotx*        suinvzco3d*     supaste*        susorty*        suweight*       utmconv*
cz1*            normray*        smoothint2*     sudmovz*        suk1k2filter*   supef*          suspecfk*       suwellrf*       varlist*
cz1in*          overwrite*      spsplot*        sudoc*          sukdmig2d*      supermute*      suspecfx*       suwind*         vel2stiff*
dctcomp*        pause*          stiff2vel*      sudumptrace*    sukdmig3d*      supgc*          suspeck1k2*     suwindpoly*     velconv*
dctuncomp*      pdfhistogram*   striptotxt*     suea2df*        sukdsyn2d*      supickamp*      suspike*        suxcontour*     velpert*
dirtree*        percent*        su3dchart*      suedit*         sukeycount*     suplane*        susplit*        suxcor*         velpertan*
downfort*       precedence*     suabshw*        sueipofi*       sukeyword*      supofilt*       sustack*        suxedit*        vtlvz*
dt1tosu*        prplot*         suacor*         suenv*          sukfilter*      supolar*        sustatic*       suxgraph*       weekday*
dzdv*           psbbox*         suaddevent*     sufctanismod*   sukfrac*        suprod*         sustaticrrs*    suximage*       why*
elacheck*       pscontour*      suaddhead*      sufdmod1*       sukill*         supscontour*    sustkvel*       suxmax*         wkbj*
elamodel*       pscube*         suaddnoise*     sufdmod2*       suktmig2d*      supscube*       sustolt*        suxmovie*       wpc1comp2*
elaps*          pscubecontour*  suaddstatics*   sufdmod2_pml*   sulog*          supscubecontour* sustrip*       suxpicker*      wpc1uncomp2*
elaray*         psepsi*         suagc*          sufft*          sumax*          supsgraph*      susum*          suxwigb*        wpccompress*
elasyn*         psgraph*        sualford*       sufilter*       sumean*         supsimage*      suswapbytes*    suzero*         wpcuncompress*
elatriuni*      psimage*        suamp*          sufind*         sumedian*       supsmax*        susyncz*        suztot*         wptcomp*
entropy*        pslabel*        suascii*        sufind2*        sumigfd*        supsmovie*      susynlv*        swapbytes*      wptuncomp*
farith*         psmanager*      suattributes*   suflip*         sumigffd*       supswigb*       susynlvcw*      sxplot*         wtcomp*
fcat*           psmerge*        suazimuth*      sufnzero*       sumiggbzo*      supswigp*       susynlvfti*     t*              wtuncomp*
filetype*       psmovie*        suband*         sufrac*         sumiggbzoan*    suptdiff*       susynvxz*       tetramod*       xcontour*
ftnstrip*       pstopdfcymk*    subfilt*        sufxdecon*      sumigprefd*     suptprod*       susynvxzcs*     this_year*      xgraph*
ftnunstrip*     pswigb*         subset*         sugabor*        sumigpreffd*    suptquo*        sutab*          thom2hti*       ximage*
gbbeam*         pswigp*         succwt*         sugain*         sumigprepspi*   suptsum*        sutaper*        thom2stiff*     xmovie*
gendocs*        randvel3d*      sucddecon*      sugausstaper*   sumigpresp*     suput*          sutaup*         time_now*       xpicker*
Grep*           raydata*        sucentsamp*     sugazmig*       sumigps*        supws*          sutetraray*     todays_date*    xrects*
grm*            rayt2d*         suchart*        sugendocs*      sumigpspi*      suquantile*     sutifowler*     transp*         xwigb*
h2b*            rayt2dan*       suchw*          suget*          sumigpsti*      suquo*          sutihaledmo*    tri2uni*        xy2z*
hti2stiff*      rcpall*         sucliphead*     sugethw*        sumigsplit*     suradon*        sutivel*        trimodel*       z2xyz*
hudson*         rcslocks*       sucmp*          sugoupillaud*   sumigtk*        suramp*         sutsq*          triray*         zap*
```

Data Processing Modules

- Separate the modules that deal with numerical operations. Modules like FFT, AGC, NMO, DMO, modeling, migration, raytracing, filtering, wavelet generation, smoothing, interpolation, deconvolution, synthetic data generation, data resampling, time-to-depth conversion, velocity analysis, data statistics.

- Exclude visualization, OS utilities, data copy utilities, plotting, printing, graphic conversion, header dumps, header manipulation, parameter manipulation, shell scripts.

Reflection Seismic Package	Geophysics modules	Other
Madagascar	282	102
SEPlib	80	104
SU	280	115
FreeUSP, FreeDDS		
Pseis		
CPSeis		
SPARC		
BotoSeis		
GEBR		
SeaSeis		
JavaSEIS		

Data Processing Modules

- SU does not seem to handle little and big endian data format, only native.
- SEPlib has data_format= flag, for xdr_float (big endian) and native_float (little endian on PCs).
- Madagascar seems to handle both data formats, though I did not find the data format parameter.

Graphics

SU:

- xcontour
- ximage
- xwigb
- xgraph
- xmovie

xmovie < data.bin n1=1000 n2=2000 (loop=1)

Same for SU format, suxcontour, suxwigb, suximage, suxmovie, suxgraph and for plotting Postscript, pscontour, psimage, pscube, etc.

Graphics

SEPlib:

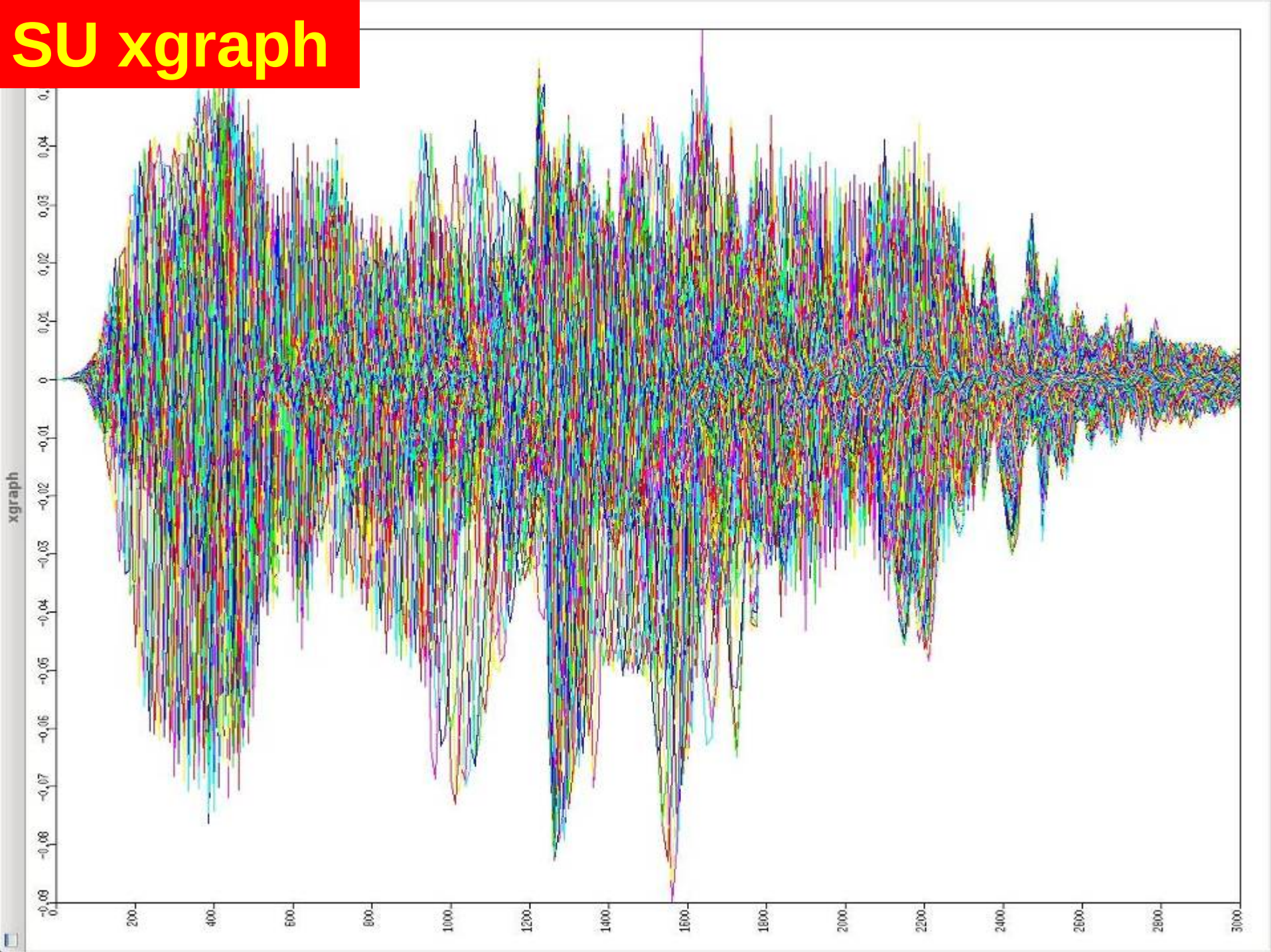
- Contour
- Grey (also does movies)
- Graph
- Rickmovie, Ricksep
- Wiggle
- Thplot (obsolete)

Graphics

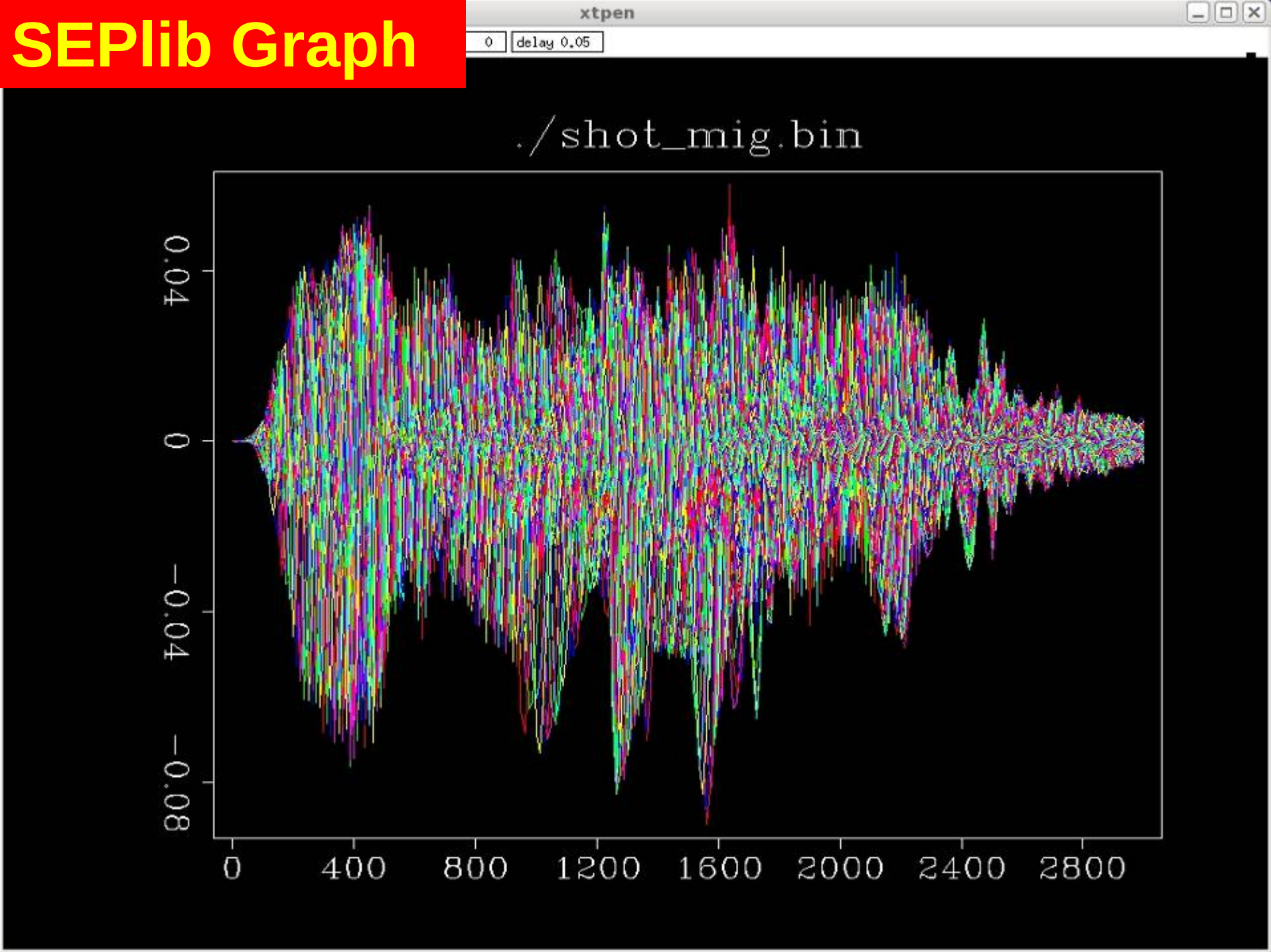
Madagascar:

- sfcontour, sfcontour3
- sfgraph, sfgraph3
- sfgrey, sfgrey3
- sfwigb, sfwiggle
- sfcubeplot, sfgrey

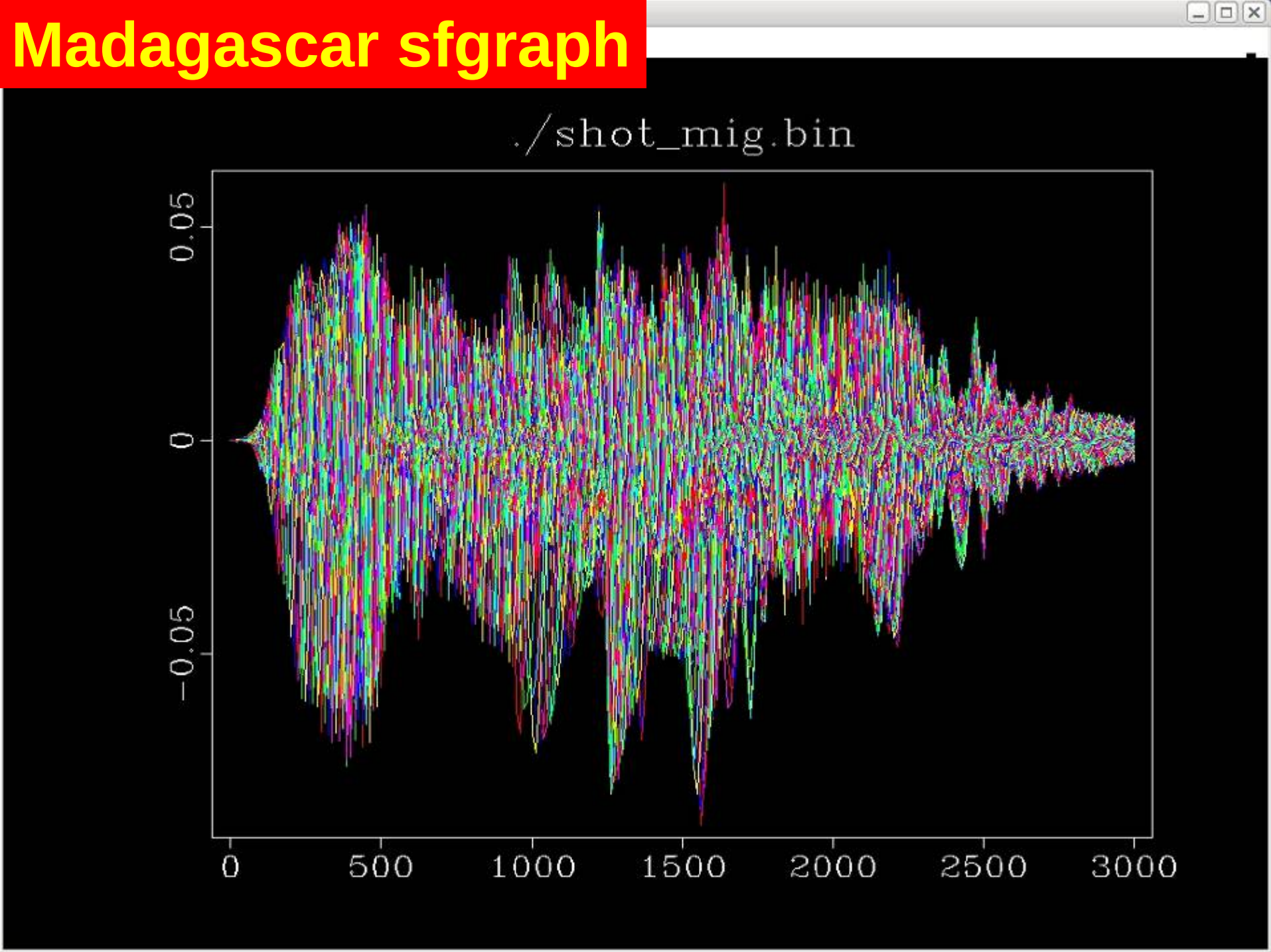
SU xgraph


xgraph
0.05
0.04
0.03
0.02
0.01
0
-0.01
-0.02
-0.03
-0.04
-0.05
-0.06
-0.07
-0.08
-0.09
200
400
600
800
1000
1200
1400
1600
1800
2000
2200
2400
2600
2800
3000

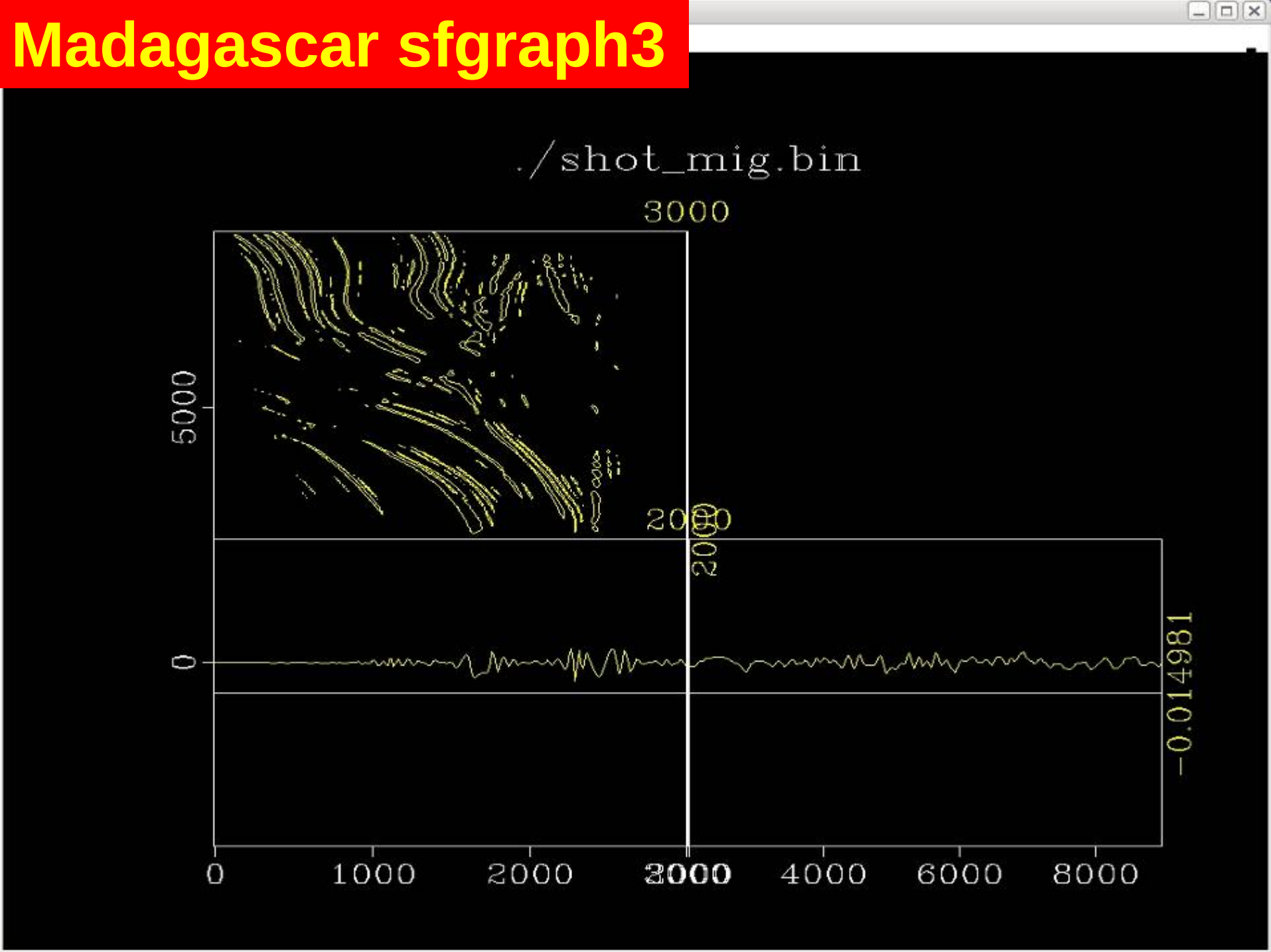
SEPlib Graph



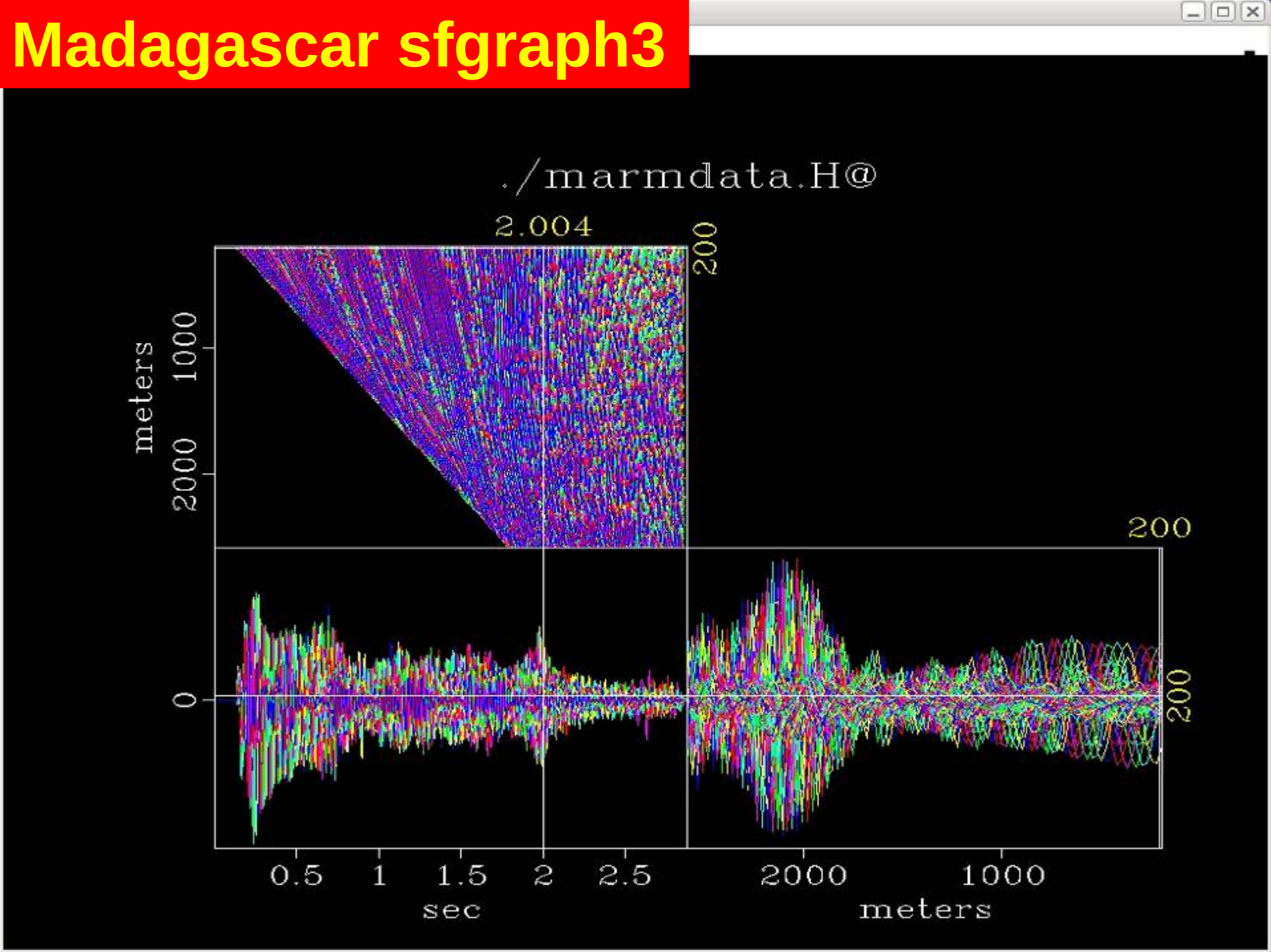
Madagascar sfgraph



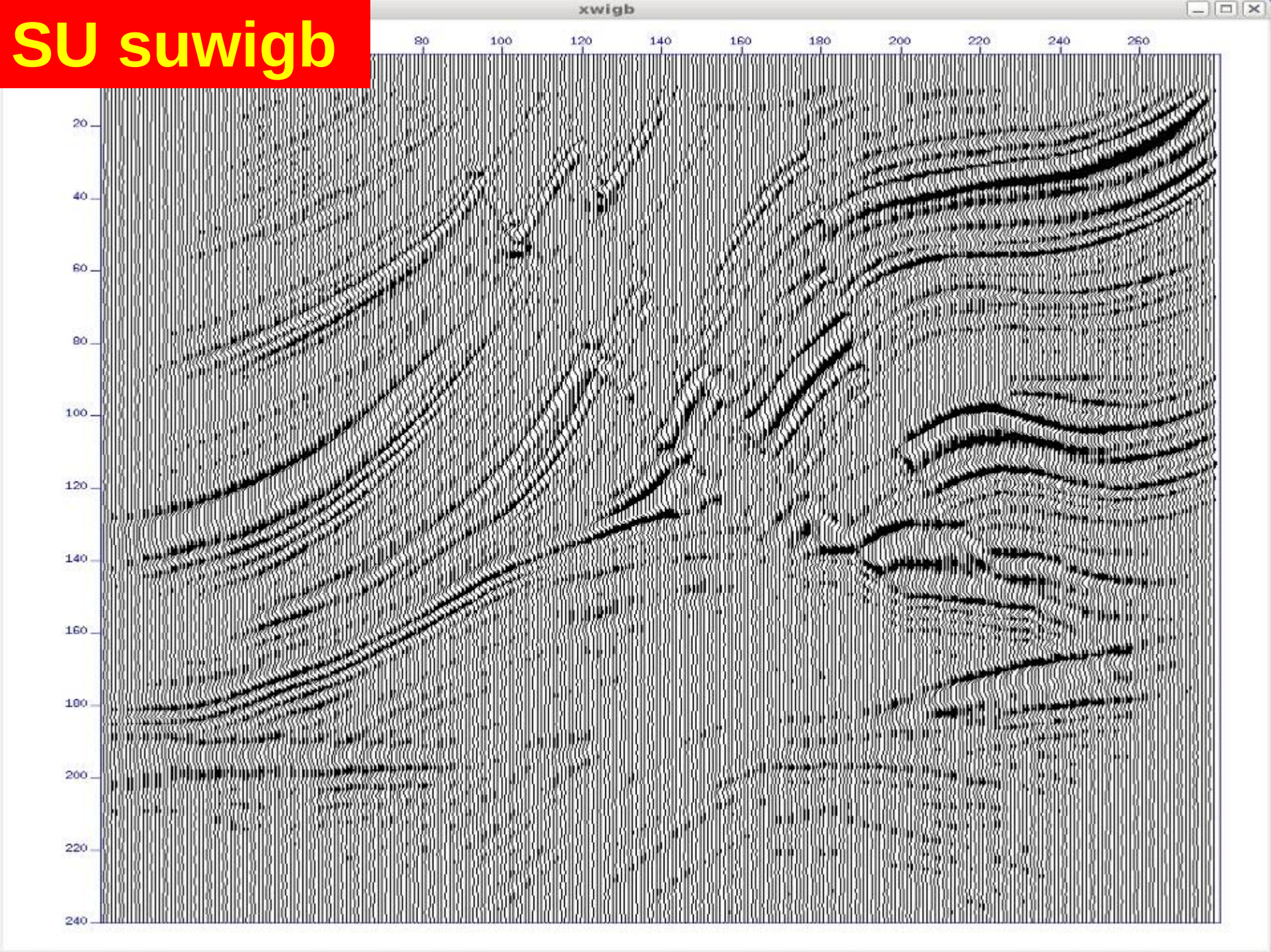
Madagascar sfgraph3



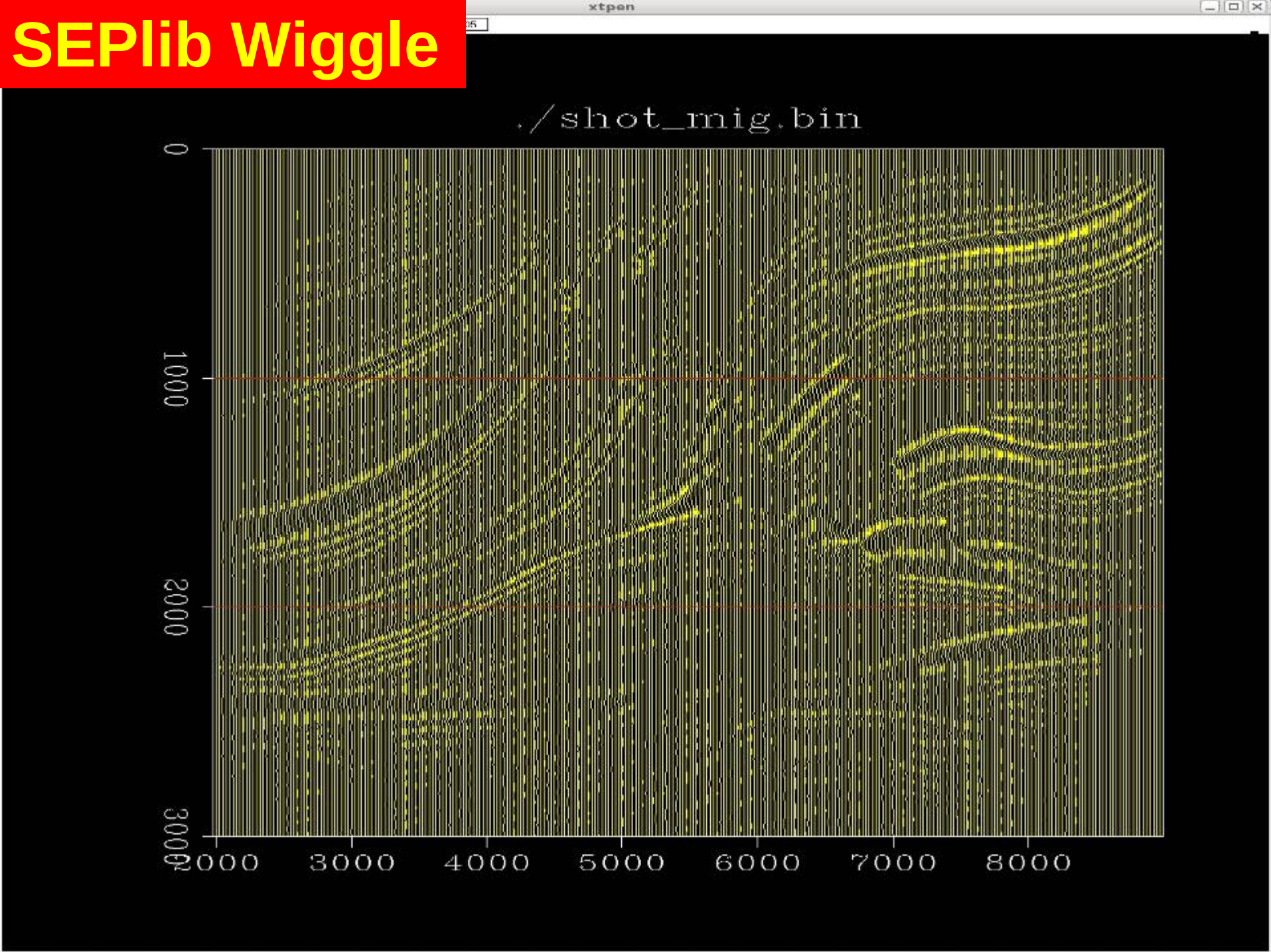
Madagascar sfgraph3



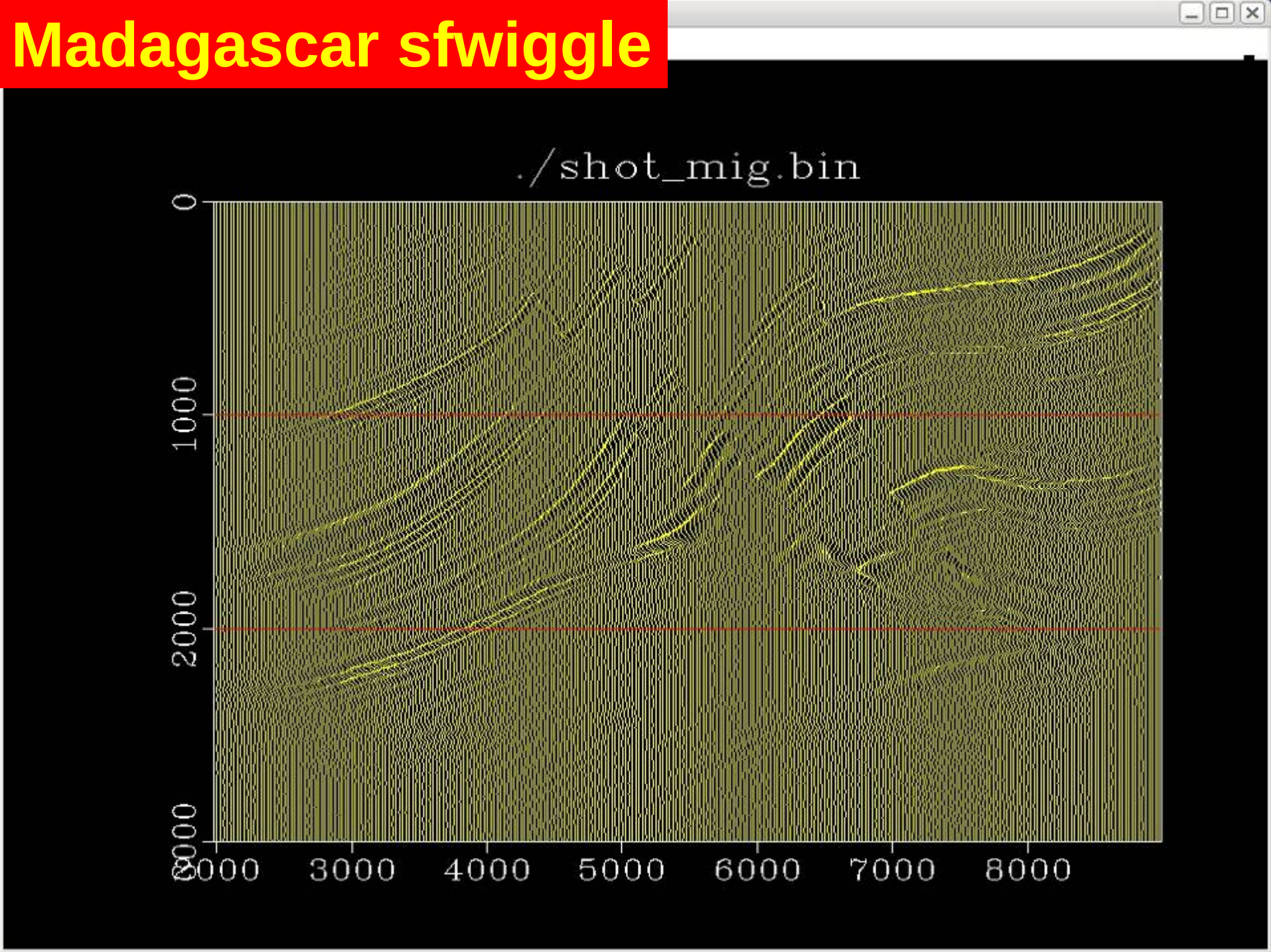
SU suwigb


xwigb
80
100
120
140
160
180
200
220
240
260
20
40
60
80
100
120
140
160
180
200
220
240

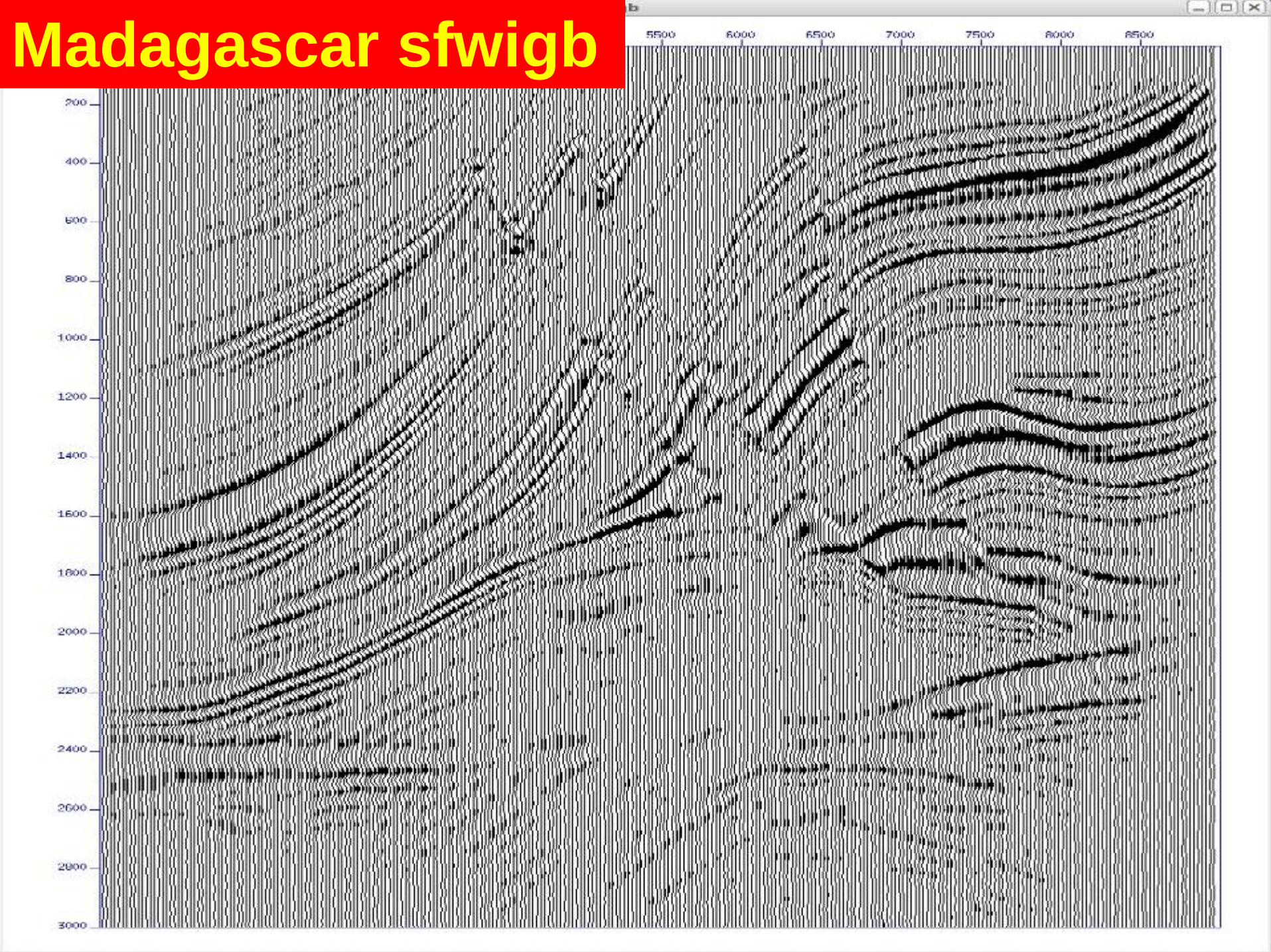
SEPlib Wiggle



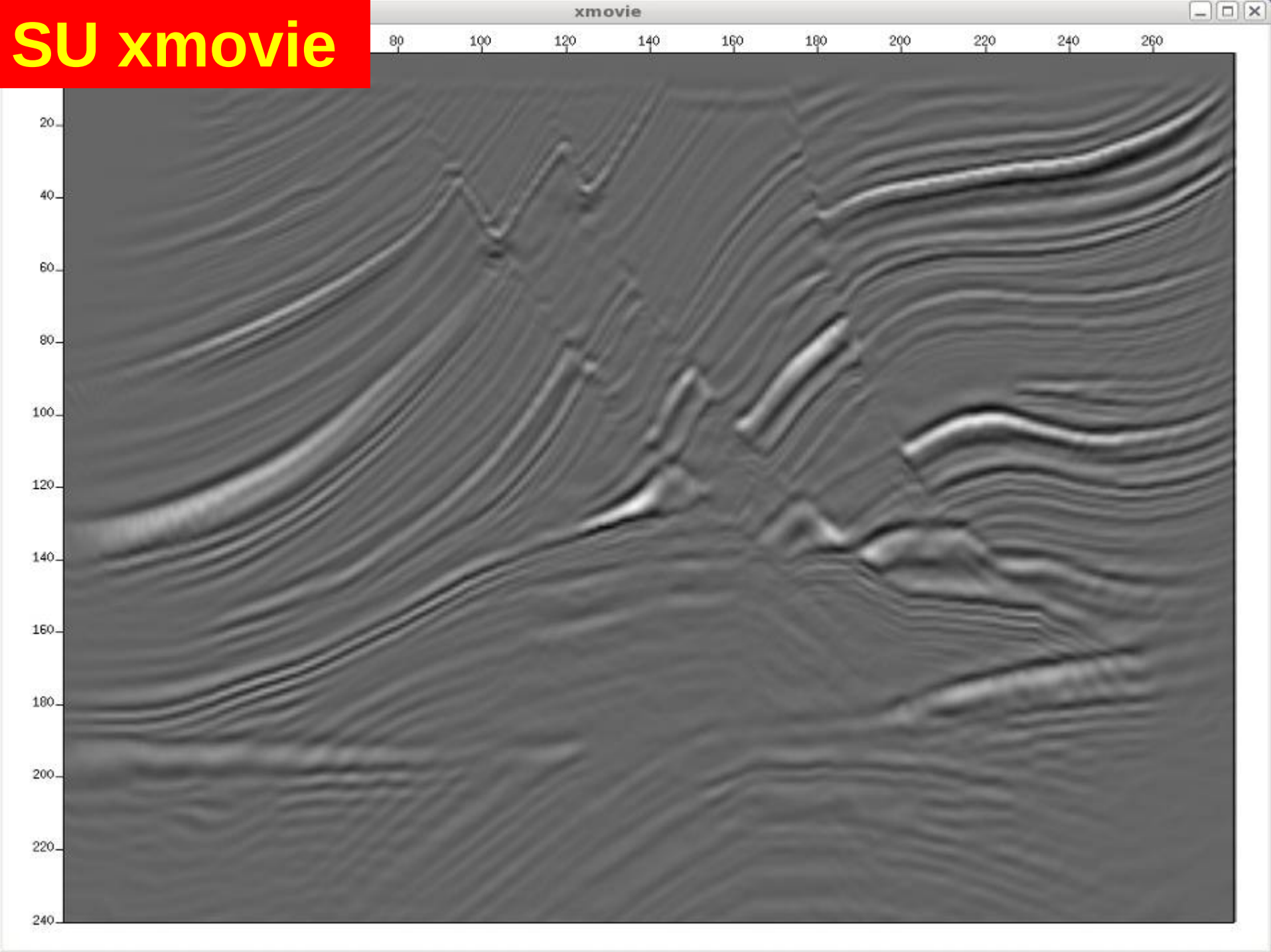
Madagascar sfwiggle



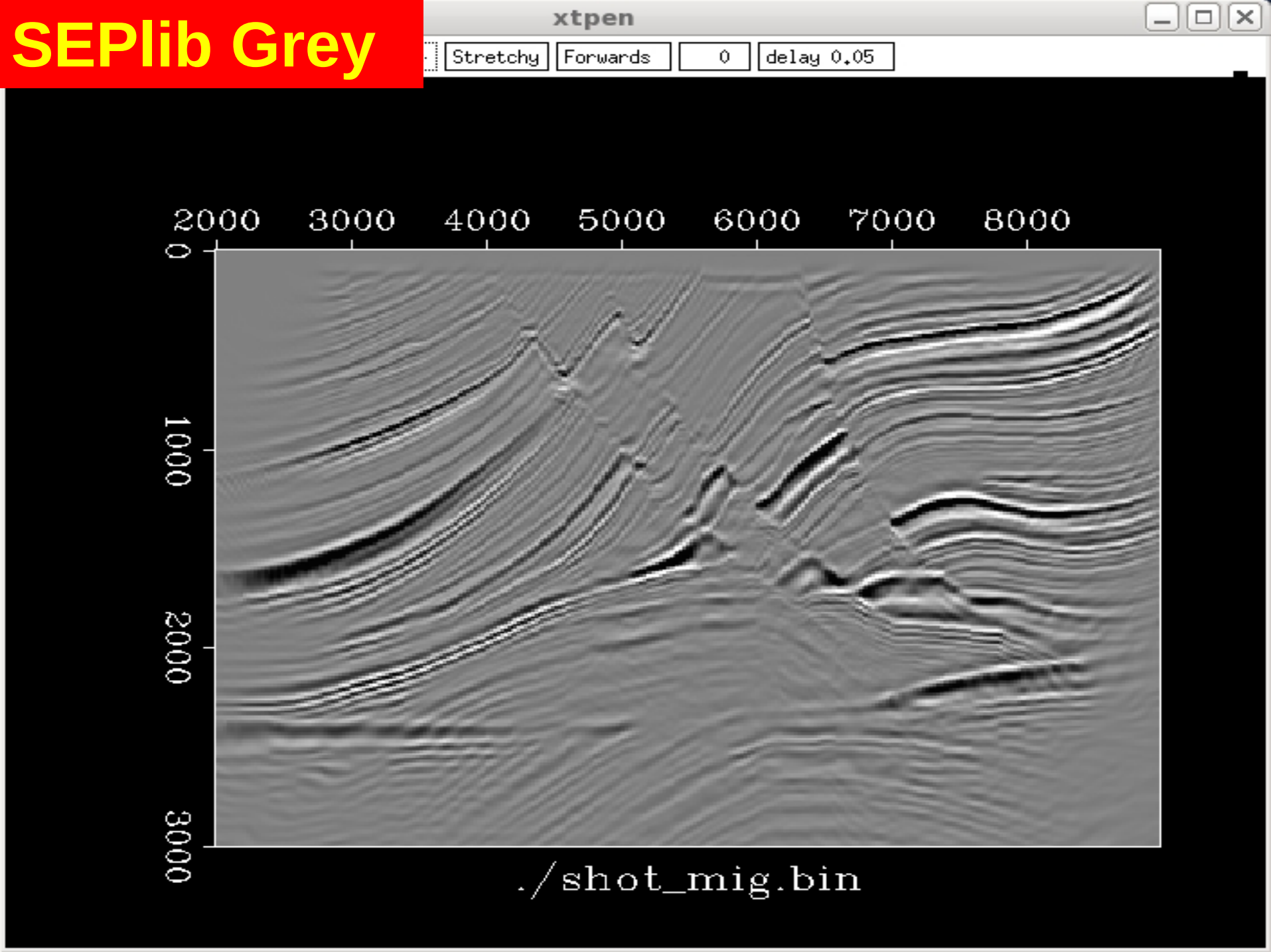
Madagascar sfwigb



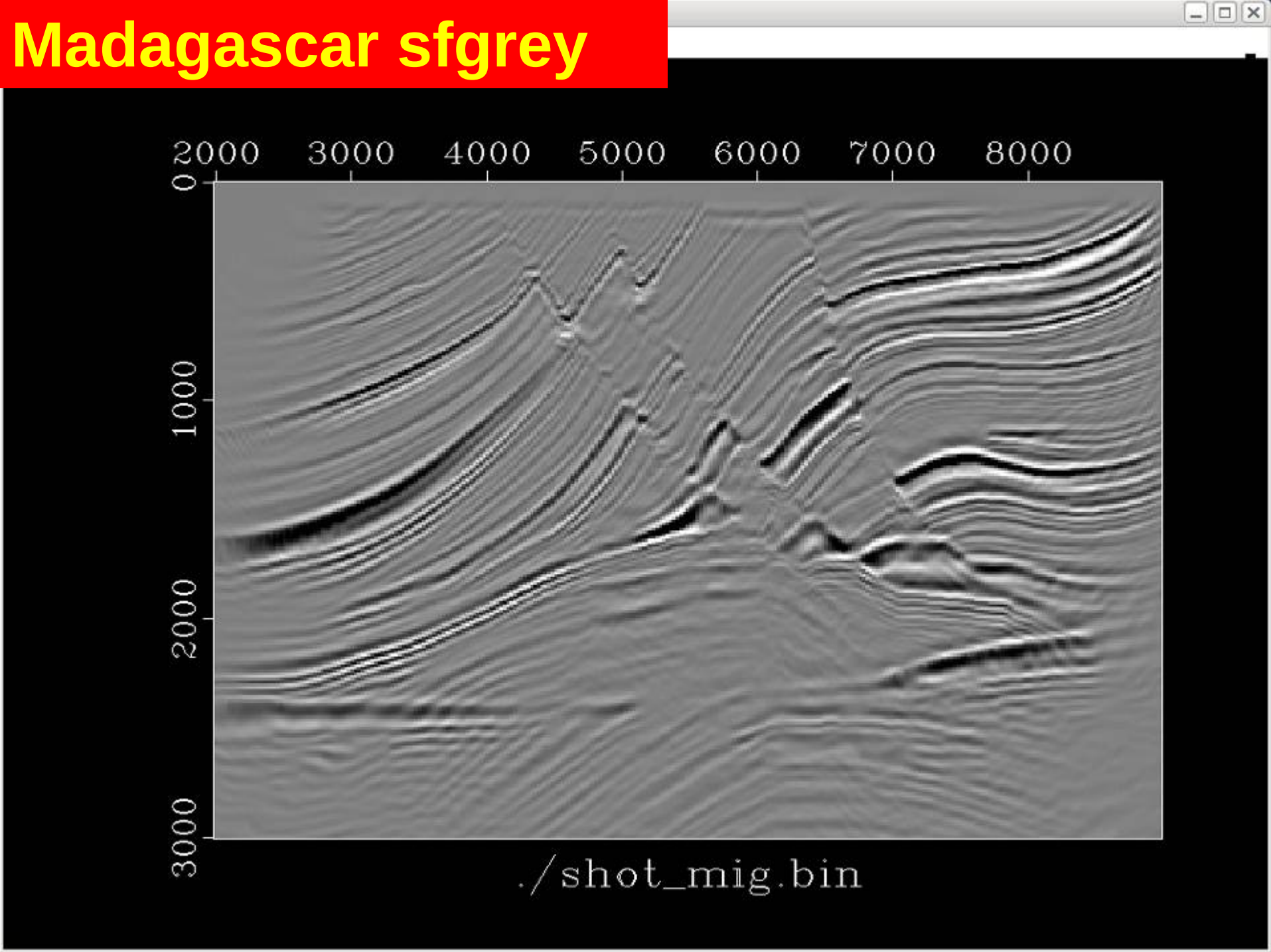
SU xmovie


xmovie
80
100
120
140
160
180
200
220
240
260
20
40
60
80
100
120
140
160
180
200
220
240

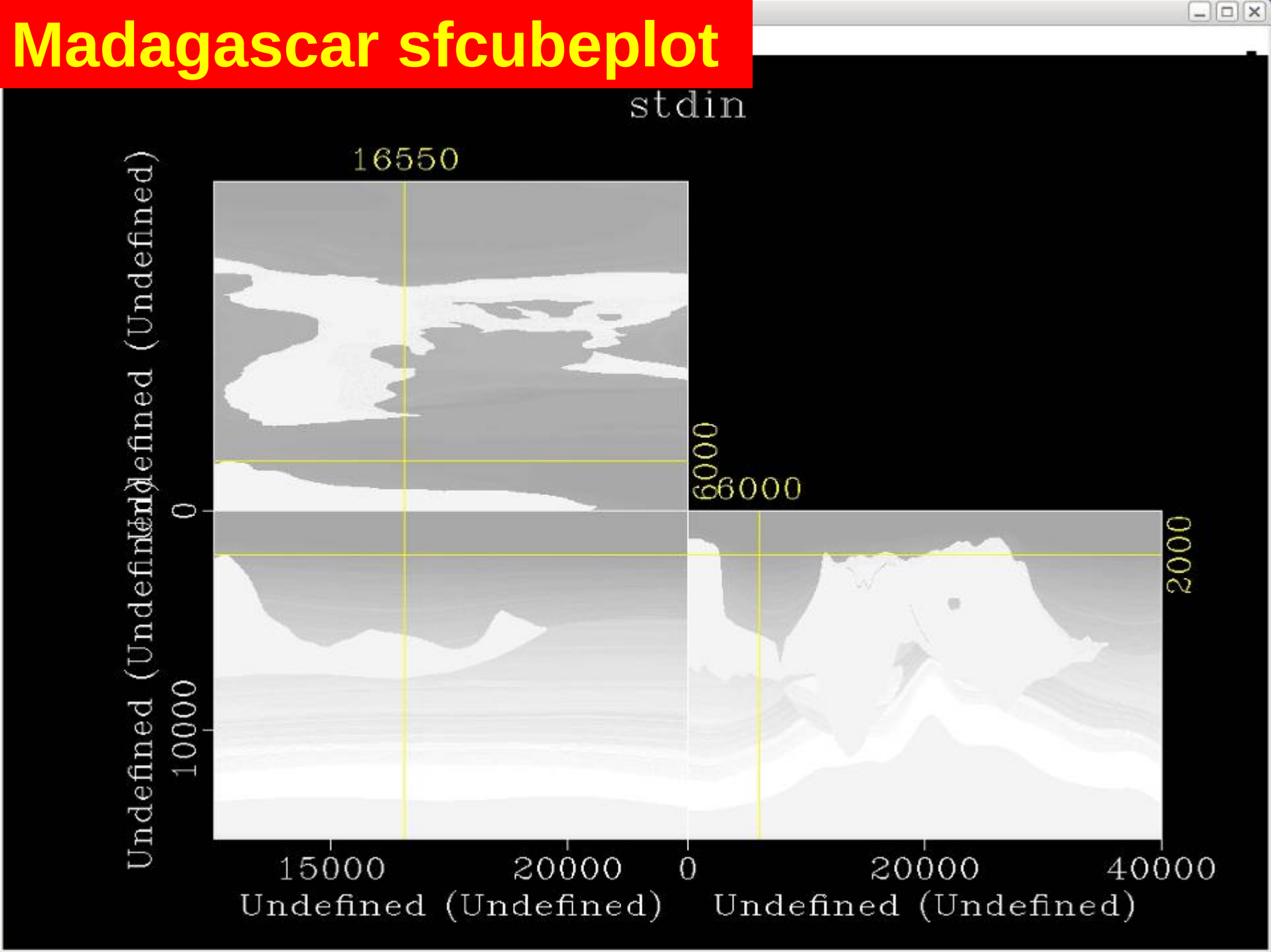
SEPlib Grey


xtpen
Stretchy
Forwards
0
delay 0.05
2000
3000
4000
5000
6000
7000
8000
0
1000
2000
3000
./shot_mig.bin

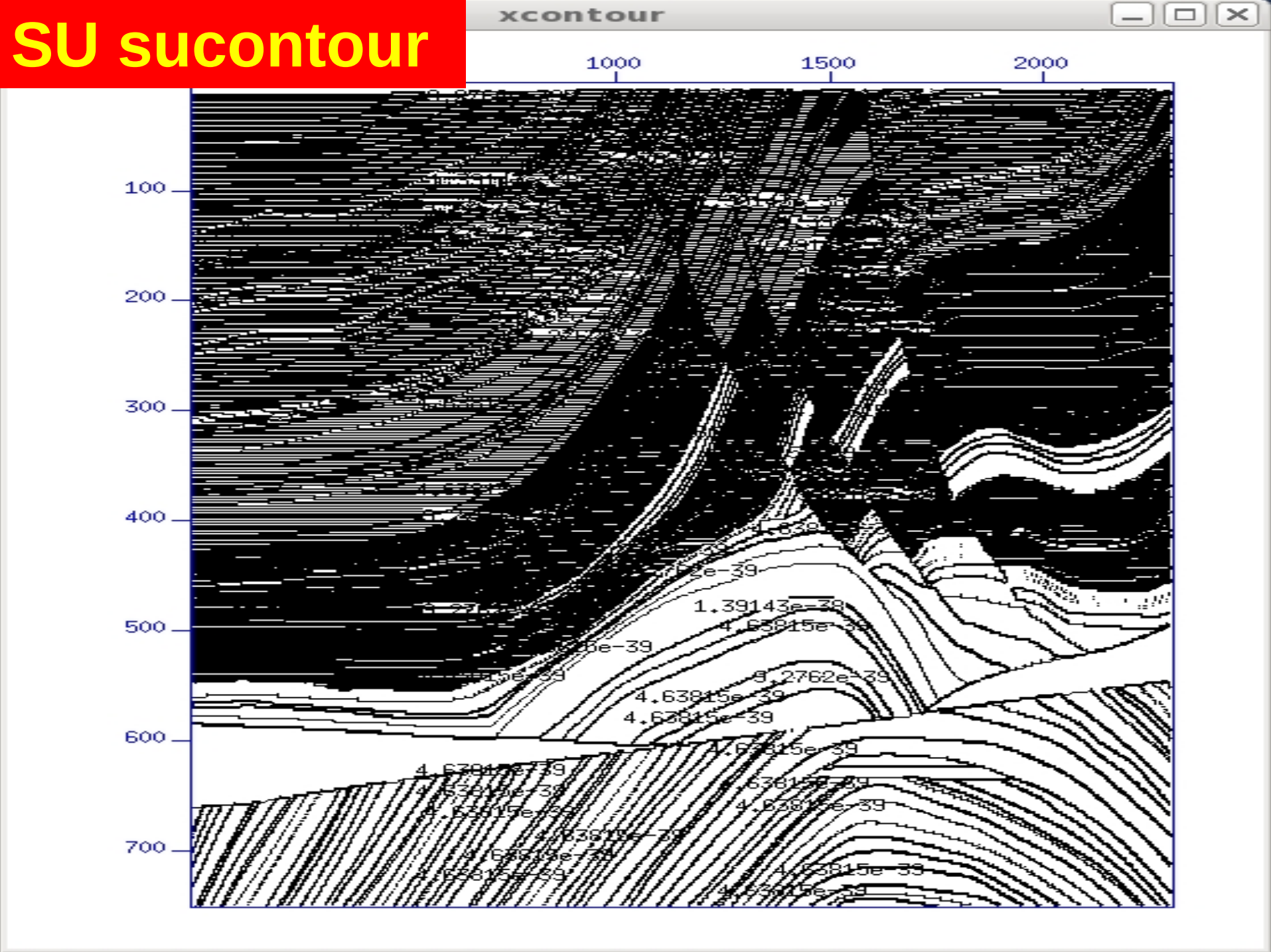
Madagascar sfgrey



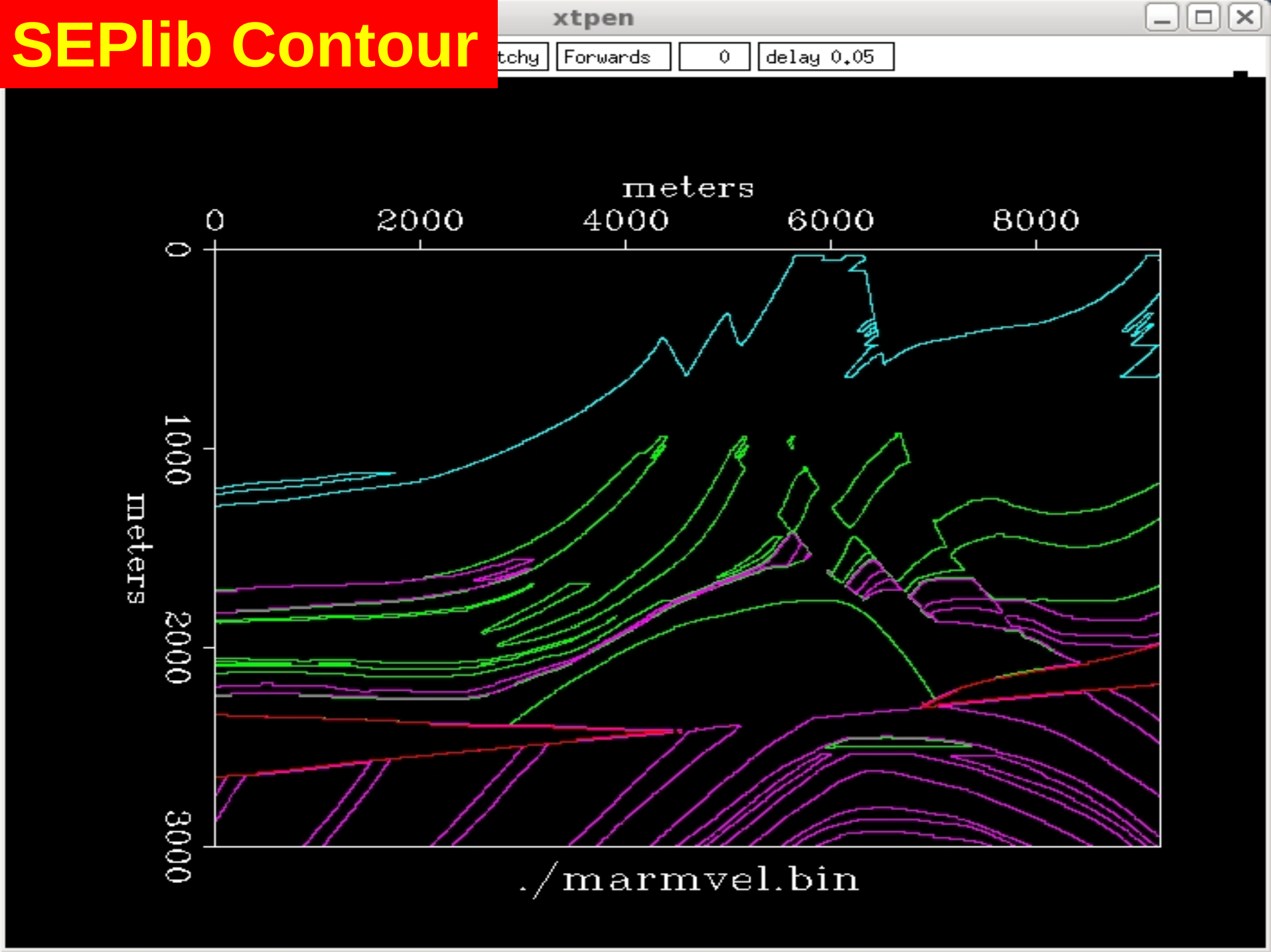
Madagascar sfcubeplot



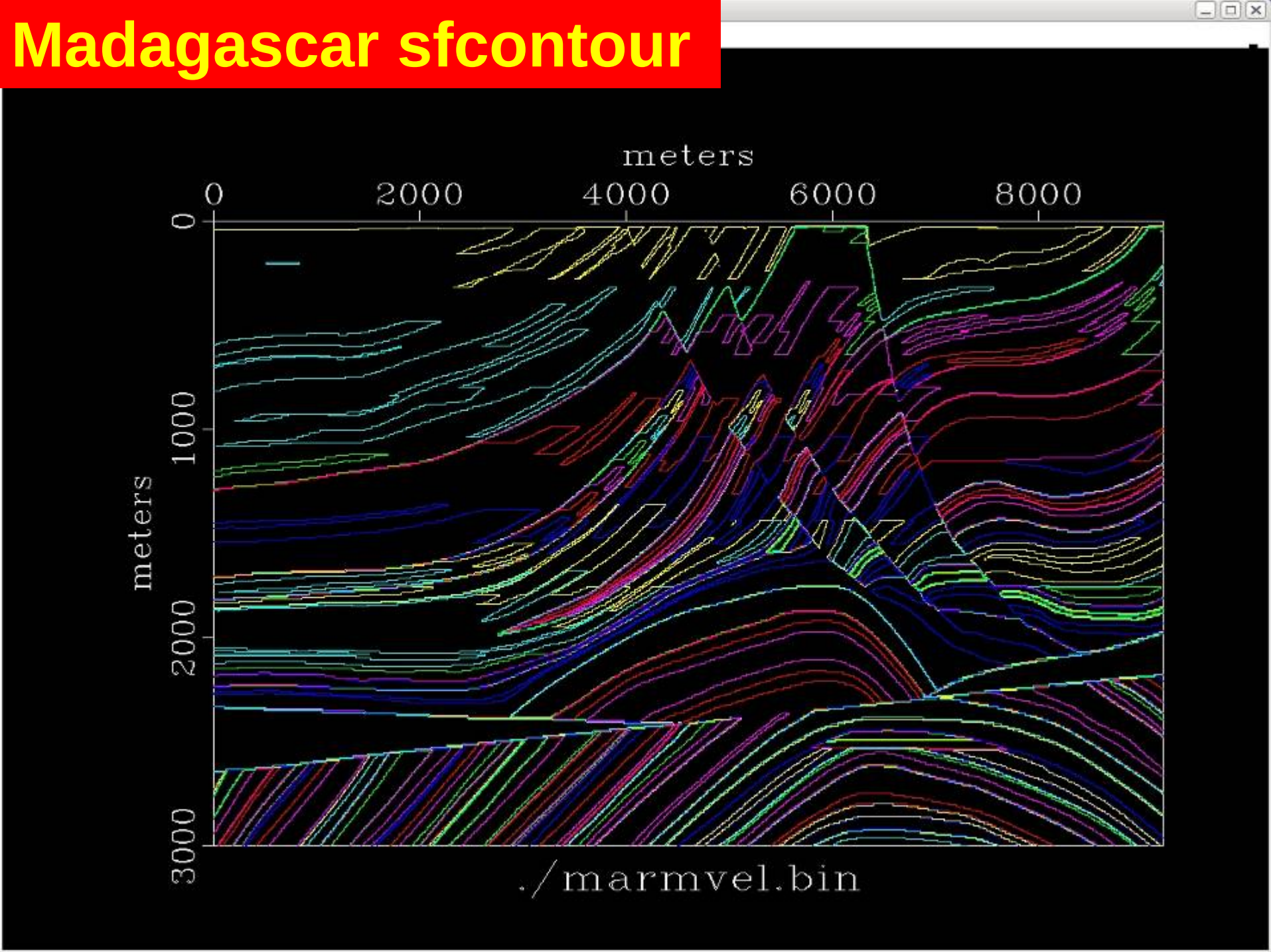
SU sucontour



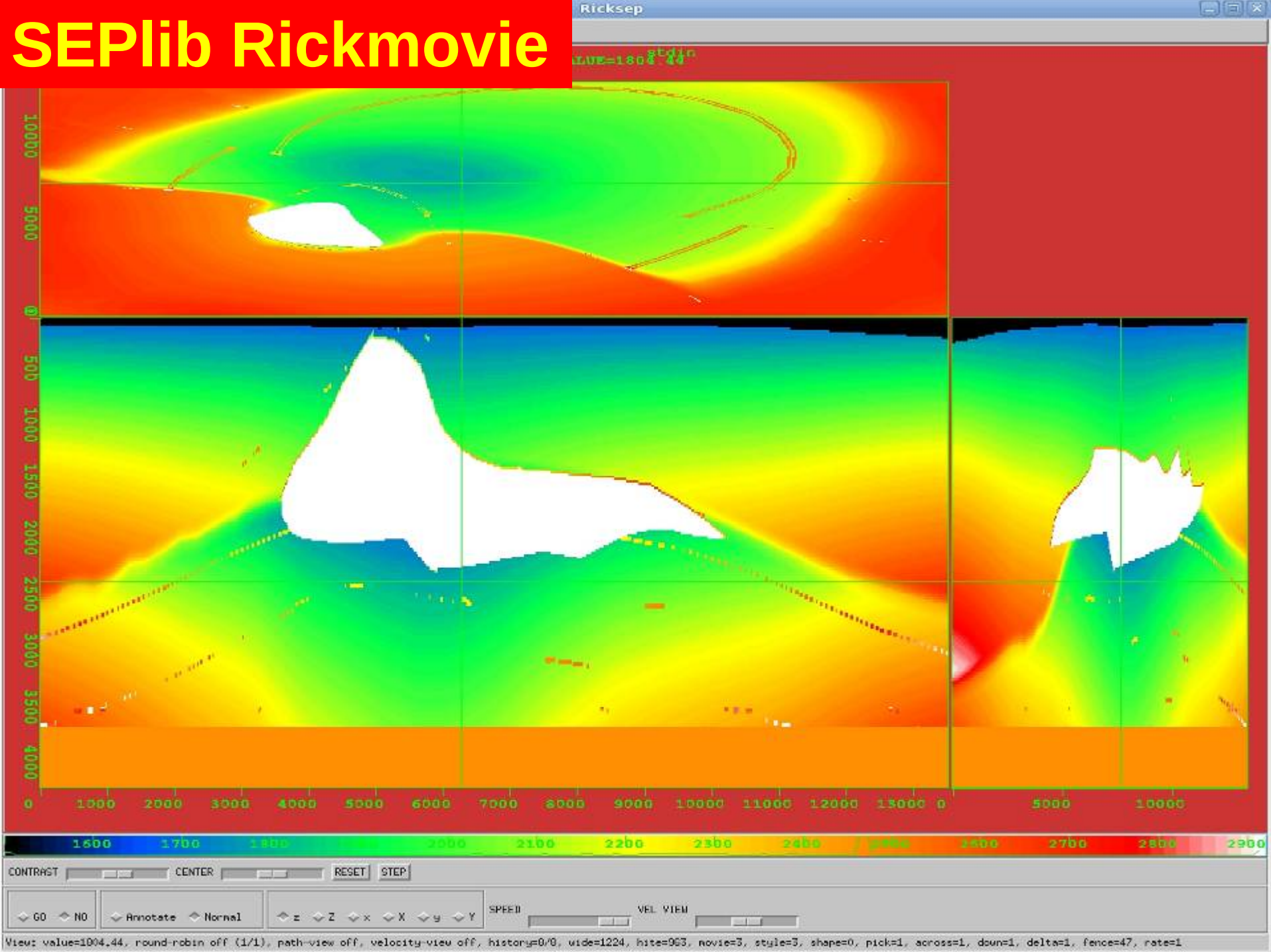
SEPlib Contour



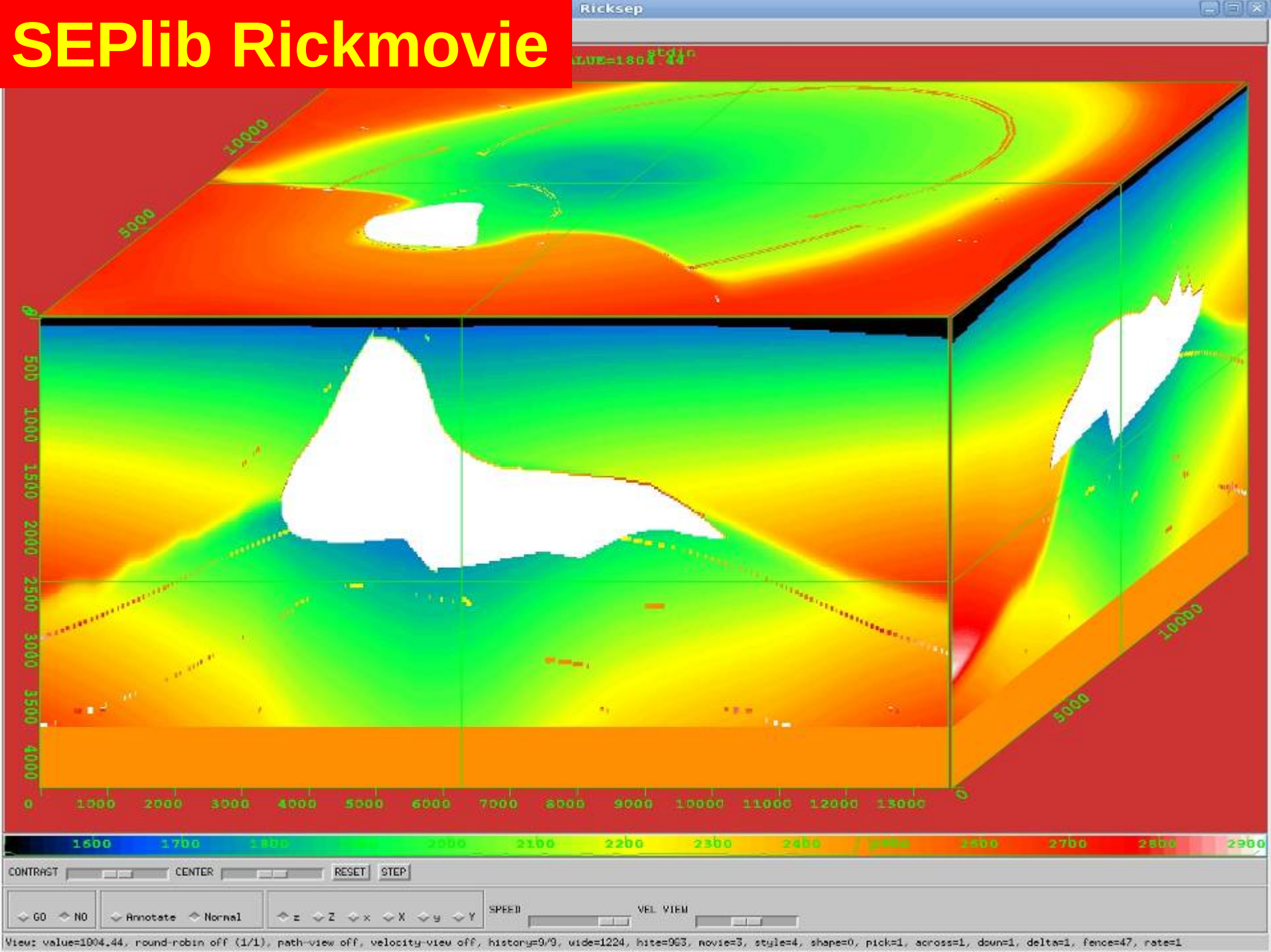
Madagascar sfcontour



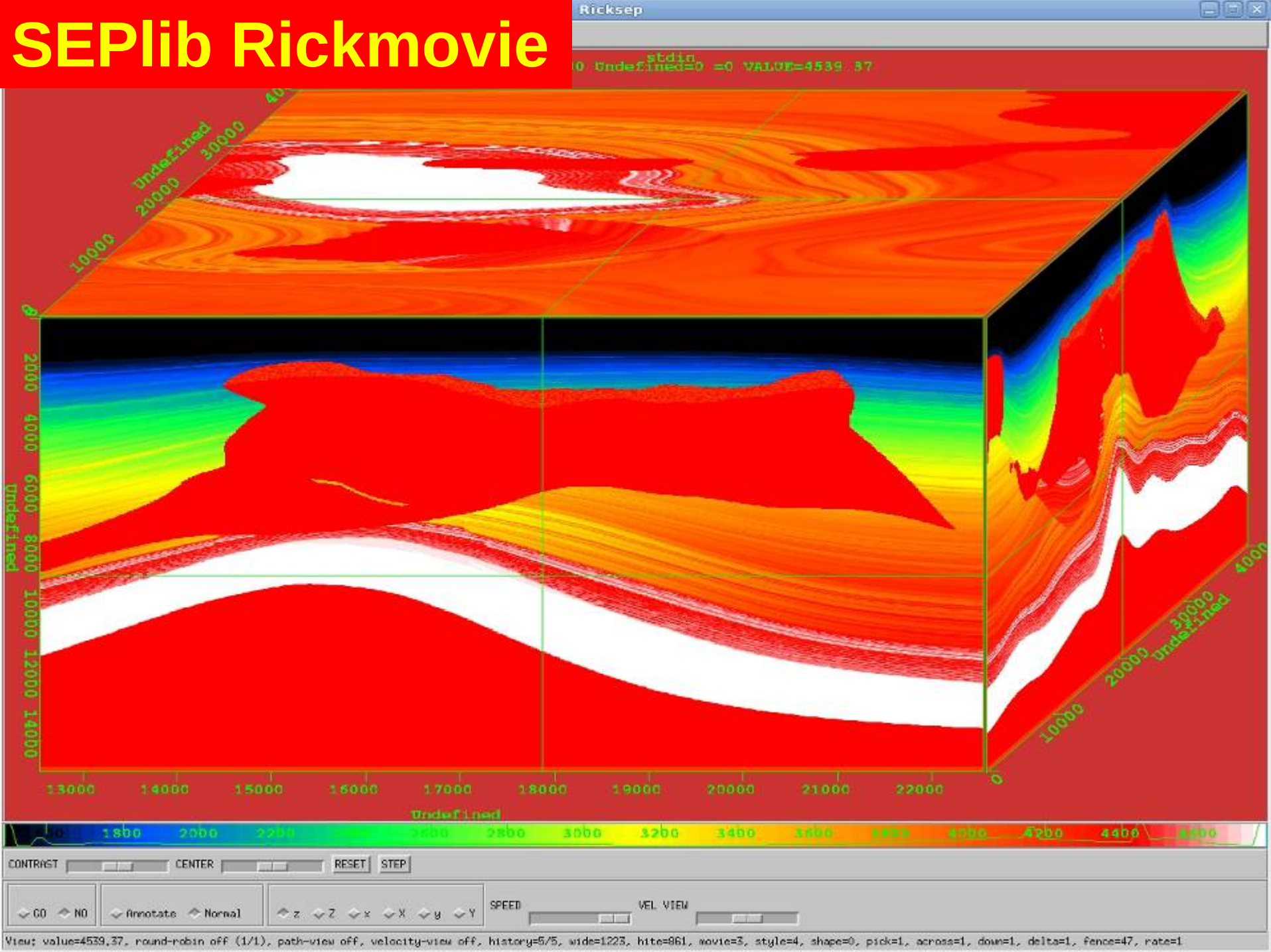
SEPlib Rickmovie



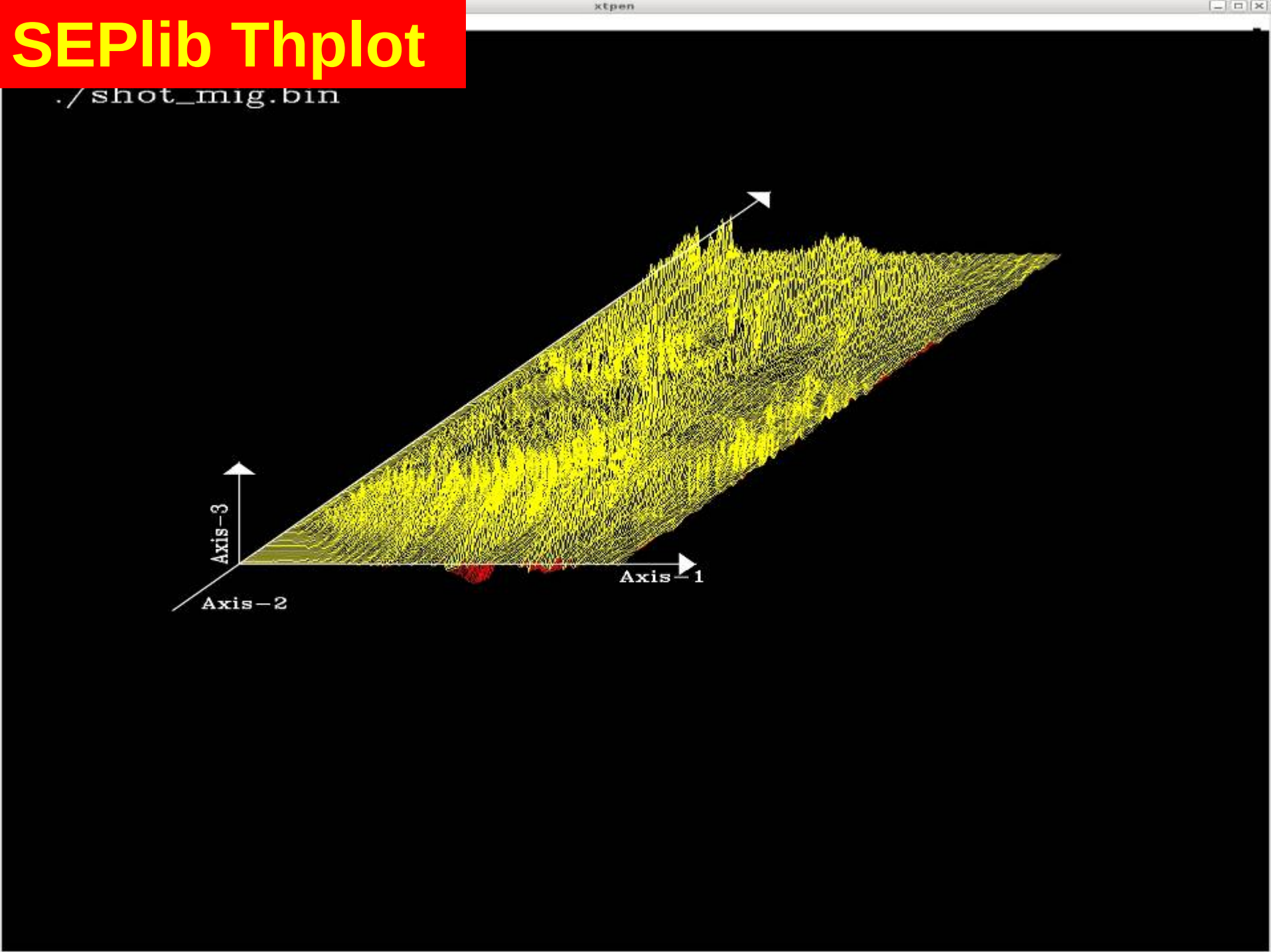
SEPlib Rickmovie



SEPlib Rickmovie



SEPlib Thplot



Conclusions

SU: Strong front-end time processing, primarily trace based, not a lot of modern depth imaging algorithms. Some anisotropy research modules.

Madagascar: More modern imaging algorithms, wave-equation concepts, angle gathers modules, prediction error filters, interpolators, missing data, helix filters, more dynamic development.

SEPlib: Obsolete. Will disappear once Madagascar incorporated all its functionality.