

TanerHilbert

A little command line tool (macOS only) to perform Taner bandpass filtering and Hilbert transformation.

https://www.rocksolidimages.com/attributes-revisited/#_Toc328470897

```
Welcome to tanerHilbert Analysis(version 0.0.1, build 2). ©2018 Heiko Pälke
Usage: tanerHilbert [options] file
file format: tab separated columns, data must be equidistantly spaced. Instead of file can specify '-' for
stdin.
-h, --help:
    Displays help message.
-l, --lowerFreqLimit:
    Lower frequency for taner bandpass. Default: 0.0
-u, --upperFreqLimit:
    Upper frequency for taner bandpass. Default: 0.5 (NYQUIST if deltaT = 1)
-l2, --lowerFreqLimit2:
    Lower frequency for second taner bandpass. Default: 0.0
-u2, --upperFreqLimit2:
    Upper frequency for second taner bandpass. Default: 0.5 (NYQUIST if deltaT = 1)
-r, --rollOver:
    rollOver. Default: 1e12 roll-off/octave
-d, --detrendingOrder:
    Order for polynomial detrending. 0 removes DC only. >0 removes a polynomial fit. Default: not set
-s, --filterAbscissaLower:
    filter on Abscissa (x-axis) data greater or equal than value specified.
-e, --filterAbscissaUpper:
    filter on Abscissa (x-axis) data lesser or equal than value specified.
-z, --columnSeparator:
    Use this as columns separator for input file instead of default tab \t. Default: \t
-k, --skipHeaderLines:
    Specify number of (header)lines to be skipped. Default: 0
-a, --abscissaColumn:
    Specify column number for abscissa (time or depth). Default: 1
-o, --ordinateColumn:
    Specify column number for ordinate (data). Default: 2
-t, --deltat:
    Specify time/depth offset between data. Default: 1.0
-O, --timeOrigin:
    Specify time/depth origin. Default: first time
--time_scaling:
    Specify if time column is in negative days, and convert to kyr. Default: false
-n, --decimate:
    Specify decimation of input data. Default: 1 (take every value)
--version:
    Shows current version and build of this software
-v, --verbose:
    Print verbose messages. Specify multiple times to increase verbosity.
--references:
    Shows references to papers and sources.
--licenses:
    Shows licenses of code components used in this software.
```

Binary download:

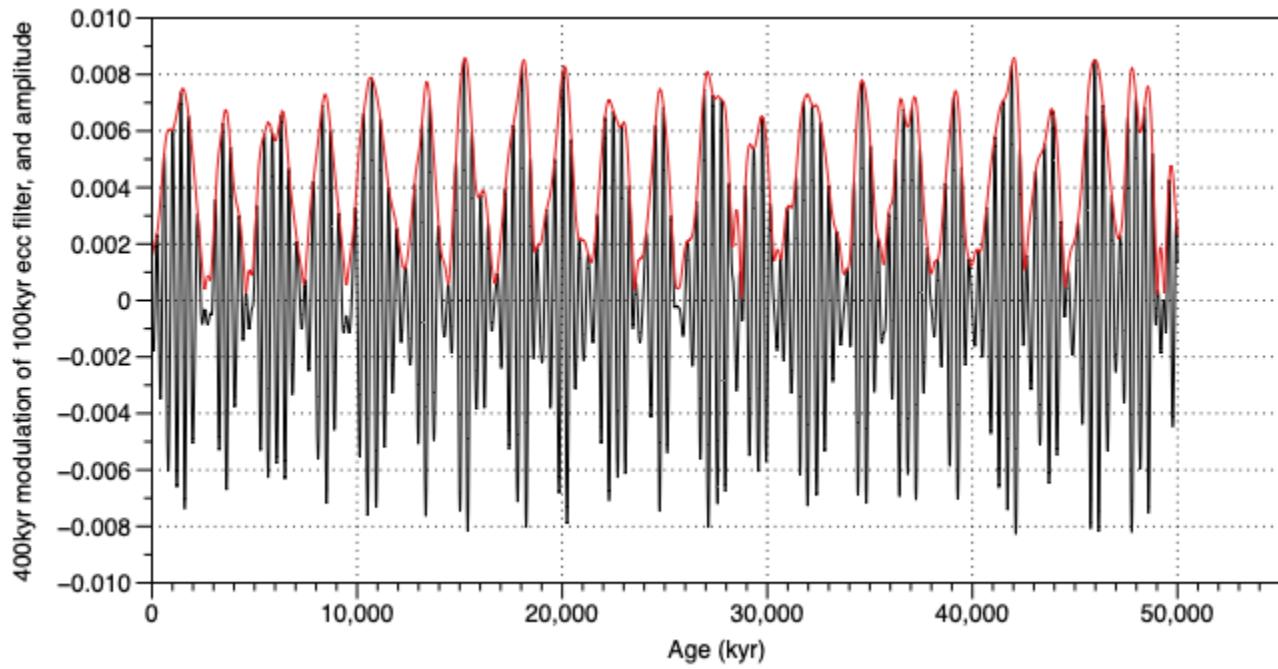


tanerHilbert

after download, add execute permissions by 'chmod a+x ./tanerHilbert'

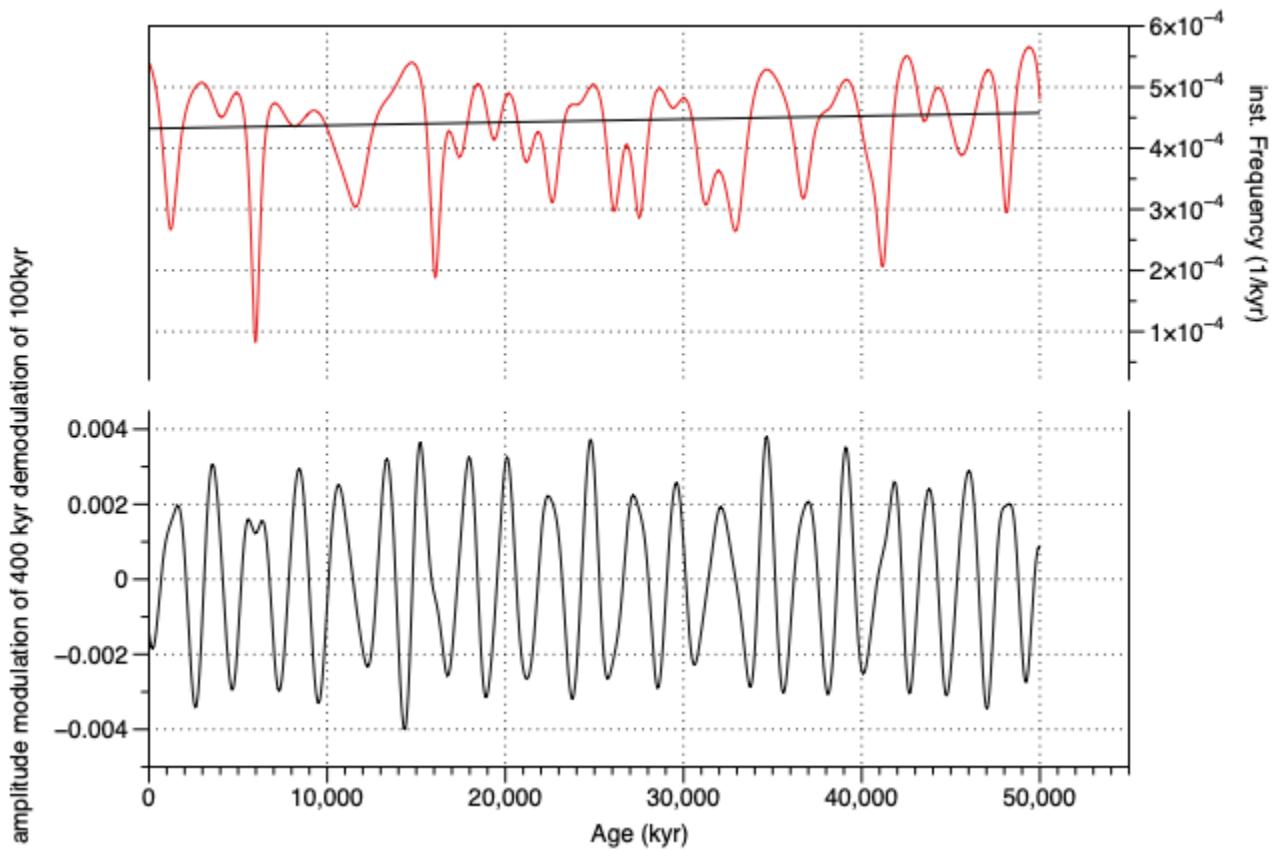
Then try it on a sample file [La2004_ecc.txt](#)

```
user$ ./tanerHilbert -t 1.0 -k 1 -l 0.0045 -u 0.0145 -s 0.0 -e 100000.0 -l2 0.0012 -u2 0.0037 La2004_ecc.txt > La2004_ecc_deamp.txt
```



Then filter and demodulate again:

```
user$ ./tanerHilbert -t 1.0 -l 0.00025 -u 0.001 -s 0.0 -e 100000.0 -o 4 La2004_ecc_deamp.txt -k 1 > La2004_ecc_deamp2.txt
```



The bottom graph shows the ~2.4 Myr amplitude modulation of the 400kyr modulation of the 100kyr eccentricity component. Top red graph shows instantaneous frequency (would be around $1/2400 = 4.16 \times 10^{-4}$ for a 2.4 Myr cycle).

References:

1. Taner (2003): https://www.rocksolidimages.com/attributes-revisited/#_Toc328470897
2. Zeeden, C. et al. (2018), Taner filter settings and automatic correlation optimisation for cyclostratigraphic studies, *Computers & Geoscience* 19, p. 18-28, doi:[10.1016/j.cageo.2018.06.005](https://doi.org/10.1016/j.cageo.2018.06.005)