PyTsfit Manual

Chapter 1

Installation

1.1 Lib

1.1.1 Numpy

conda install numpy

1.1.2 Scipy

conda install scipy

1.1.3 Matplotlib

conda install matplotlib

1.1.4 Pyproj

pip install pyproj

Chapter 2

Input Files

2.1 GPS Time Series

PyTsfit can process GPS time series in PBO POS format.

2.2 Earthquake File

2.3 Priori Information

2.3.1 Secular Velocity

We usually need to isolate postseismic transient from GPS time series. In order to obtain postseismic displacement from raw position time series, one can estimate the velocity term along with postseismic and other terms or can just substrate a prior value. The velocity file contains prior values for these stations. The format of the file is and unit is mm/yr:

$$\boxed{Lon,\ Lat,\ V_e,\ V_n,\ Sig_{ve},\ Sig_{vn},\ Cor_{en},\ Site,\ Vu,\ Sig_{vu}}$$

2.3.2 Coseismic Displacements

If one want to correct coseismic offsets using prior values. A coseismic displacement file should be prepared following the below format. The unit of displacement is mm.

$$\boxed{E,\ N,\ U,\ Site,\ decimal\text{-}year}$$

2.3.3 Non-earthquake Breaks

If one want to correct non-earthquake breaks using prior values. A coseismic displacement file should be prepared following the below format. The unit of displacement is mm.

$$\boxed{E,\ N,\ U,\ Site,\ decimal\text{-}year}$$

2.3.4 Periodic Displacements

In some cases, periodic displacements especially the vertical component should be corrected using prior values estimated from GRACE solutions. The format is listed below and unit is mm.

$E_{sa}, E_{ca}, E_{ssa}, E_{csa}, N_{sa}, N_{ca}, N_{ssa}, N_{csa}, U_{sa}, U_{ca}, U_{ssa}, U_{csa}, Site$

sa: sin annual term   ssa: sin semi-annual term

cs: cos annual term   csa: cos semi-annual term