Geodetic Strain Analysis Tool

NASA's Jet Propulsion Laboratory, Pasadena, California

A geodetic software analysis tool enables the user to analyze 2D crustal strain from geodetic ground motion, and create models of crustal deformation using a graphical interface. Users can use any geodetic measurements of ground motion and derive the 2D crustal strain interactively. This software also provides a forward-modeling tool that calculates a geodetic velocity and strain field for a given fault model, and lets the user compare the modeled strain field with the strain field obtained from the user's data.

Users may change parameters "on-the-fly" and obtain a real-time recalculation of the resulting strain field. Four data products are computed: maximum shear, dilatation, shear angle, and principal components. The current view and data dependencies are processed first. The remaining data products and views are then computed in a round-robin fashion to anticipate view changes. When an analysis or display parameter is changed, the affected data products and views are invalidated and progressively re-displayed as available.

This software is designed to facilitate the derivation of the strain fields from the GPS and strain meter data that sample it to facilitate the understanding of the strengths and weaknesses of the strain field derivation from continuous GPS (CGPS) and other geodetic data from a variety of tectonic settings, to converge on the "best practices" strain derivation strategy for the Solid Earth Science ESDR System (SESES) project given the CGPS station distribution in the western U.S., and to provide SESES users with a scientific and educational tool to explore the strain field on their own with user-defined parameters.

This work was done by Sharon Kedar, Sean C. Baxter, Jay W. Parker, Frank H. Webb, Susan E. Owen, Anthony J. Sibthorpe, and Danan Dong of Caltech for NASA's Jet Propulsion Laboratory. Further information is contained in a TSP (see page 1).

This software is available for commercial licensing. Please contact Daniel Broderick of the California Institute of Technology at danielb@caltech.edu. Refer to NPO-47504.