Geophysical Research Abstracts
Vol. 19, EGU2017-16962-1, 2017
EGU General Assembly 2017

Application of a variable patches inversion algorithm to the August-November 2016 seismic sequence in Central Italy.

Andrea Antonioli, Simone Atzori, and Stefano Salvi
Istituto Naizionale di Geofisica e Vulcanologia (andrea.antonioli@ingv.it)

The study of a seismogenic fault exploiting geodetic data (DInSAR and GPS) is usually carried out with non-linear modelling procedures, searching for the fault geometry and a uniform slip value on the fault plane. The slip distribution is then calculated via linear inversion by dividing the dislocation plane into patches.
The linear optimal fault resolution algorithm (Atzori and Antonioli 2011) is a fault splitter that has been developed to compute the coseismic slip on main structures keeping into account data distributions and fault geometries.
The algorithm used here automatically retrieves an optimized fault subdivision in the linear inversion of coseismic geodetic data. With respect to the usually employed linear inversion codes which subdivide the fault plane in uniform subfaults with intrinsically different resolution power, this code adjusts the fault dimensions iteratively in order to keep the parameter resolution close to a predefined value. We retrieve a slip distribution over a set of patches that are perfectly solved by the data, without the introduction of mathematical artefacts and keeping slip details as close as possible to the real resolution power of the data.
The entire inversion chain has been applied on fault planes of the main events of the 2016 seismic sequence, with a special focus on the 30-10 Mw 6.5, which showed a particularly complex multiple fault plane distribution. The computed surface displacements are satisfactorily, showing that we do not need to artificially oversplit the fault planes in order to mimic the available observations.