Geophysical Research Abstracts
Vol. 18, EGU2016-13819, 2016
EGU General Assembly 2016


# Fault Network Reconstruction using Agglomerative Clustering: Applications to South Californian Seismicity

Yavor Kamer (1), Guy Ouillon (2), and Didier Sornette (1)
(1) ETH Zurich, Switzerland, (2) Lithophyse, Nice, France

We present applications of a new clustering method for fault network reconstruction based on the spatial distribution of seismicity. Current methods start from the simplest large scale models and gradually increase the complexity trying to explain the small scales, whereas the method introduced in this study uses a bottom-up approach, by an initial sampling of the small scales and then reducing the complexity by optimal local mergers. We describe the implementation of the method through illustrative synthetic examples. We then apply the method to the absolute, non-linear KaKiOS-15 catalog, which consists of three decades of South Californian seismicity. To reduce data size and increase computation efficiency the new approach builds upon the recently introduced catalog condensation method that exploits the location uncertainty associated with each event. We validate the obtained fault network through a retrospective spatial forecast test and discuss possible improvements for future studies.

The performance of the introduced model attests to the importance of the location uncertainty information, which is a crucial input for the large scale application of the method. We envision that the results of this study could be used to construct improved models for temporal evolution of seismicity.