ID: Type: **Poster**

Framework of Ground Truth Event Locations Across Iran from a Two Tiered Multi-Event Relocation Approach

Uncertainties in standardized earthquake locations, which run into tens-of kilometers in many regions of the world, are a serious limitation to seismotectonic studies. We have developed a new two-tiered multiple-event relocation approach that seeks to improve upon these catalog locations, and have applied it to Iran, a country with abundant seismicity (> 40,000 ISC Bulletin events since 1960), a recent surge in station coverage, but with known shortcomings in location accuracy. In the first stage, locations of small clusters of well-recorded earthquakes at local spatial scales are calibrated either with near-source arrival times or with independent location constraints such as from InSAR or short-duration aftershock deployments. This stage uses MLOC, an implementation of the Hypocentroidal Decomposition relocation technique, that specifically minimizes systematic bias and fully calibrates the location uncertainty, usually to better than 5 km (GT5). Secondly, these calibrated locations with their uncertainties are used as a backbone of "ground truth" events in BayesLoc, a Bayesian relocation algorithm that can handle larger datasets, to yield region-wide earthquake catalogs that are less vulnerable to systematic bias and have realistic estimates of the location uncertainty. We illustrate the improved locations by re-interpreting a selection of early instrumental and modern mainshock-aftershock sequences.

Primary author: KARASOZEN, Ezgi (Colorado School of Mines)

Presenter: KARASOZEN, Ezgi (Colorado School of Mines)

Track Classification: 1. The Earth as a complex system