

Ssa2py: Source-Scanning Algorithm in Python

Nikolaos Triantafyllis (1,2) and Christos Evangelidis (1)

(1) National Observatory of Athens, Institute of Geodynamics, Athens, Greece, (2) National Technical University of Athens, School of Electrical and Computer Engineering, Athens, Greece

Backprojection methods provide the alternative novel approach to image the spatiotemporal earthquake rupture. They can also rapidly identify the correct rupture plane of a significant event. This is achieved by stacking the seismic waveforms along predicted traveltimes for the corresponding seismic phase and source–receiver paths. Ssa2py is an upcoming open-source python based software. The program intends to follow the method of the Source-Scanning Algorithm (SSA), a backprojection approach, by Honn Kao and Shao-Ju Shan (2007), where it calculates the brightness function for each grid point by summing the observed waveforms/envelopes at the specific arrival times at all defined stations. Ssa2py tends to generate a series of images -according to time span calculation- that illustrate the locations on the rupture plane where meaningful seismic energy is produced. Concerning software implementation "Mass Downloader for FDSN Compliant Web Services" Obspy module seems to be the key for easily seismic waveform data retrieval while the multiprocessing python library may provide rapid calculations in parallel mode using multiple threads.