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Discriminating between induced, triggered and natural seismicity

To discriminate between recent seismicity around Lake Nasr Aswan region whether is induced or triggered by Lake Reservoir or is of natural origin, we analyze moment tensor solutions and source spectra of recent recorded earthquakes in the area. The earthquake focal mechanisms including source mechanism parameters and source spectra can give important information to assist in discriminating between natural and induced seismic events. In this work, we computed moment tensors and stress drop values for five recent induced events recorded by Egyptian National seismic network (ENSN) around Lake Nasr, Aswan Area with magnitudes between 3.0 and 4.5 as well as five nearby earthquakes from Red Sea with magnitudes ranging from 4.0 to 5.5 events that are interpreted as natural events. We performed full waveform inversion for the studied seismic events including complete moment tensor and dominant double-couple (DC) signature. Our results exhibited that most induced events demonstrate significant non-double-couple components. The estimated focal depths of most Induced events are significantly shallower than focal depths for inter-plate and intraplate earthquakes in and around area under investigation. On the other hand, Stress drops and source spectra of studied events are used as another key to differentiate between natural and induced events

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