[EE] Evening Poster | S (Solid Earth Sciences) | S-CG Complex & General

[S-CG56]Asian Earthquakes, Volcanoes and Tectonics

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Sun. May 20, 2018 5:15 PM - 6:30 PM Poster Hall (International Exhibition Hall7, Makuhari Messe)
The geological structures and tectonics are complex in the Asian region. Many orogenic belts and active faults exist within the Asian continent, and active subductions occur in its surrounding regions. In the east, the Pacific and Philippine Sea plates are subducting beneath East Asia, causing the development of trench-arc-backarc systems. In the southwest, the Indian plate is subducting beneath the Eurasian plate, forming major topographic features, such as the Himalayan mountain chain and the Tibetan Plateau. Due to the intense interactions among the four tectonic plates, large earthquakes take place frequently, such as the 2008 Wenchuan earthquake (M 8.0), the 2011 Tohoku-oki earthquake (M 9.0), the 2015 Nepal earthquake (M 7.9), and the 2016 Kumamoto earthquake (M 7.3). In addition to many arc volcanoes caused by plate subductions, some active intraplate volcanoes exist in Asia, but their origin and relationship with the intraplate tectonics are still not very clear. In this session, we welcome original or review presentations from fields of geology, geophysics, petrology and geochemistry addressing issues of geological structures, seismotectonics, volcanism and geodynamics of the Asia region.

[SCG56-P02]Spatiotemporal variation of focal mechanisms of Tatun volcano group, northern Taiwan

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Keywords:Tatun Volcano Group, Focal mechanism, Volcanic-tectonic events, Reservoir

Over 2000 focal mechanisms of volcanic-tectonic events (VTs) were solved between 2014 and 2016 in the Tatun Volcano Group (TVG), northern Taiwan. These focal mechanisms were obtained on the basis of the data from a dense seismic network maintained by the Taiwan Volcano Observatory-Tatun. This network is composed of 40 seismic stations and distributed uniformly within an area of 15 km by 15 km. Each seismic station is equipped with a 24 bits broadband seismometer with a 24-bit digitizer. For this reason, abundant micro-VTs occurred in the TVG could be recorded. For each micro-event, the arrival time and the first polarity of each station were recognized by manual picking. Then the VTs could be located and solved by the best-fitting focal mechanism depends on the P-wave first-motion polarity. Depending on these focal mechanisms, the spatiotemporal variation of stress state could be discussed. We found a coincident variation of occurrence between the normal faulting events in the depth between 0 and 2 km and the reverse and strike-slip faulting events in the depth between 2 and 4 km. In this research, this spatiotemporal variation of the focal mechanisms was attributed to a pumping reservoir buried in the TVG deeper than 2 km in depth. During the inflation of this reservoir, the vertical compression stress would induce a series of VTs with the normal faulting mechanisms above the reservoir ranged about 0-2 km in depth. Concurrently, the horizontal compression stress would be increased at the lateral circumambient rim of the reservoir located deeper than 2 km so that some reverse and/or strike-slip mechanisms are triggered. During the deflation of reservoir, the faulting characteristics would be changed reversely.