ID: Type: **Oral**

Earthquake Triggering and Its Mechanism After Great 2011 Tohoku Earthquake in Korean Peninsula

The Korean Peninsula is located in the far-eastern Eurasia plate, and belongs to intraplate seismicity regime with low seismicity. The instrumental seismicity is scattered over the peninsula, with relatively high seismicity at paleo-tectonic regions that are associated with paleo-rifting and paleo-collision. The paleo-rifting is responsible for the separation of Japanese islands from the Eurasian plate. The paleo-continental collisions formed a current shape of Korean Peninsula. It is known that dozens of devastating earthquakes with magnitudes of 7 occurred historically. The paleo-structures appear to be reactivated by the current ambient stress field. The Korean Peninsula is located at about 1200 km away from the 11 March 2011 M9.0 Tohoku-Oki earthquake. Nine triggered earthquakes within one hour after the Tohoku-Oki earthquake were identified in the Korean Peninsula. The sizes of triggered earthquakes are small, allowing observation only at stations in nearby distances. The short PS differential times suggests that the earthquakes appear to occur by brittle failure in shallow crust. The focal mechanism solution of the largest triggered earthquake presents normal-faulting sense of motion with a tensional axis in the southeast, suggesting that the event occurred due to the response to the displacement caused by the Tohoku-Oki earthquake. We present the spatio-temporal evolution of the Korean seismicity before and after the Tohoku-Oki earthquake. The response of intraplate regime to the rapidly sweeping dynamic stress field is discussed.

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Track Classification: Theme 2: Events and Their Characterization