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

[S-CG57]Dynamics in mobile belts

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The dynamic behaviours of mobile belts are expressed across a wide range of time scales, from the seismic and volcanic events that impact society during our lifetimes, to orogeny and the formation of large-scale fault systems which can take place over millions of years. Deformation occurs on length scales from microscopic fracture and flow to macroscopic deformation to plate-scale tectonics. To gain a physical understanding of the dynamics of mobile belts, we must determine the relationships between deformation and the driving stresses due to plate motion and other causes, which are connected through the rheological properties of the materials. To understand the full physical system, an integration of geophysics, geomorphology, and geology is necessary, as is the integration of observational, theoretical and experimental approaches. In addition, because rheological properties are greatly affected by fluids in the crust and fluid chemical reactions, petrological and geochemical approaches are also important. After the 2011 great Tohoku-oki earthquake, large-scale changes in seismic activity and regional scale crustal deformation were observed, making present-day Japan a unique natural laboratory for the study of the dynamics of mobile belts. This session welcomes presentations from different disciplines, such as seismology, geodesy, tectonic geomorphology, structural geology, petrology, and geofluids, as well as interdisciplinary studies, that relate to the dynamic behaviour of mobile belts.

[SCG57-P18]Characteristics of the seismic gap in west part of the central Kyushu, Japan

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The seismicity in Amakusa islands located at west part of Kyushu Island, Japan is much lower than other part of Kyushu. Investigating characteristics of the seismicity gap is important for knowing the mechanism of earthquake generation. Here, we conducted analyses to consider cause of the gap and effect on the surrounding area.
In this study, we considered three models to explain the low seismicity. (1) high strength model: elastic property is much higher than the surrounding area. (2) weak zone model: no brittle failure occur in the area because of weak strength, and (3) low shear loading model: weakening shear stress loaded to the region due to inelastic deformation in the surrounding area. For verifying reliability of models (1) and (2), we considered an infinite elastic plate with a circular inclusion having different elastic constants from surrounding infinite plate. And then, we compared the spatial pattern of strain based on two dimensional theoretical equation by Nishimura and Sezawa (1931) with that of observed strain rate obtained from the GNSS network. For model (3), we calculated the distribution of the inelastic strain rate due to the earthquakes using the method of Kostrov (1974). The results reveals that the crustal deformation around Amakusa islands can not be explained by the models (1) and (2). Therefore it seems the model (3) is presumable because the region with the high inelastic strain rate(~10^{-8} */yr*) is seen to

surrounding Amakusa islands. However, we need to revise the model (3) by taking into account the estimated stress field, velocity structure, and viscous structure in the Kyushu obtained by previous study.