Japan Geoscience Union Meeting 2015
(May 24th - 28th at Makuhari, Chiba, Japan)

SCG59-03 会場:106 時間:5 月 27 日 16:45-17:00

Friction of granular layer at seismic slip rates - Effect of wall disturbances
Friction of granular layer at seismic slip rates - Effect of wall disturbances

桑野 修[1*] ; 中谷 正生[2] ; 波多野 恭弘[2] ; 阪口 秀[1]
KUWANO, Osamu[1*] ; NAKATANI, Masao[2] ; HATANO, Takahiro[2] ; SAKAGUCHI, Hide[1]

[1] 独立行政法人海洋研究開発機構, [2] 東大地震研
[1]MAT/JAMSTEC, [2]ERI, Univ. of Tokyo

A natural fault has the cataclasite core zone, along which shear deformation concentrates. Rheology of these granular matters thus provides us an important insight in considering the nature of friction on faults from a microscopic point of view. In the past two decades, experiments conducted at sub‐seismic to seismic slip rates (mm/s to m/s) revealed two remarkable phenomena of high-velocity rock friction; very long critical slip distance (Dc) of the order of 1-10m/s and the considerable weakening due to mechanochemical effects by frictional heating. Recently, Chambon et al.[2006, JGR] conducted friction experiment with very large shear displacement experiment on a thick granular layer, and reported significant slip-weakening behavior active over decimetric slip distances. However, the relation between long Dc observed in a thick granular layer and long Dc in the high-velocity friction is still not clear. We designed laboratory experiments to explore transient responses of a thick granular layer following a step change in slip velocity at seismic slip rates. We use simple particle and choose relatively low normal stress to exclude the possible mechanochemical effects caused by frictional heat. We find that friction coefficient and layer thickness show similar response that is symmetry with respect to velocity changes, and Dc is of the order of 10m. It appears that these responses are attributed to dynamics of granular matter. We report effect of wall boundary disturbance on the transient responses of granular layer.