

## Relaxation processes of a thick granular layer at seismic slip rates

Osamu Kuwano<sup>1\*</sup>, Masao Nakatani<sup>2</sup>, Takahiro Hatano<sup>2</sup>, Hide Sakaguchi<sup>1</sup>

<sup>1</sup>IFREE, JAMSTEC, <sup>2</sup>ERI, University of Tokyo

We report on laboratory experiments designed to explore transient responses of a thick granular layer following a step change in slip velocity at seismic slip rates. Experiments were performed at constant normal stresses of 10-30kPa using a ring shear apparatus with inner/outer diameters of 15mm/25mm. We measure the friction coefficient and thickness of glass beads layer at sliding velocities between 0.5 and 3 m/s. Experimental results show that the friction coefficient and layer thickness suddenly increases/decrease as sudden increase/decrease of sliding velocity and then exponentially decay to new steady state with characteristic slip length. We found that characteristic slip length is of the order of 10m when the surface of sliding wall is rough. The response to a velocity step decreases simply symmetric to that to a velocity step increase. In this presentation, we discuss the effect of sliding velocity, normal stress, and surface roughness of the sliding wall on characteristic slip length.

Keywords: high-velocity friction, granular matter, rheology