

## Numerical simulations of seismic waves propagating through solids under shear stress

# Hide Sakaguchi[1]; Tsutomu Takahashi[1]

[1] IFREE, JAMSTEC

In the previous studies, we found that P-waves propagating through granular materials under direct shearing tests show clear directional dependent attenuation. Numerical simulations using the Discrete Element Method (DEM) were also performed to understand the mechanism of this attenuation. As shear goes, the heterogeneity contrast between well stressed force chains and poorly stressed force chains developed in the major principal stress direction. Therefore, we track all the wave passes particle by particle at each shearing level focusing the wave reflection and refraction. From the analysis of the individual wave from the source, we found that the wave dispersion and trap due to the heterogeneous and anisotropic force chain structure. In this study, we perform numerical simulations of seismic waves propagating through solid rocks under shear stresses to verify whether the shear induced wave attenuation is significant or not for geo-science. Rock specimens under tri-axial compression condition and spherical shell under multi-plate motion are considered for wave propagation tests.