

## Why transmission waves attenuate in sheared granular materials?

# Hide Sakaguchi[1]; Naoto Yoshioka[2]

[1] JAMSTEC, IFREE; [2] Yokohama City Univ.

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We simulate the transmission waves through sheared granular materials using the Discrete Element Method to understand the mechanism of the drastic attenuation as a precursor of slip found in our previous experimental studies. As shear goes, the contrast between well stressed force chains and poorly stressed force chains developed in the granular material becomes more and more clear. 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 find out the dispersion and trap due to the structured force chains. A proposal will be made to apply this mechanism to earthquake prediction, in terms of the precursory fault slip.