Geophysical Research Abstracts
Vol. 20, EGU2018-9403, 2018
EGU General Assembly 2018

Monitoring Temporal Variations in the Laboratory

Alison Malcolm, Lauren Hayes, Mandy Lim, and Heru Rusmanugroho
Memorial University of Newfoundland, Earth Sciences, St John's, Canada (amalcolm@mun.ca)

Whenever we observe changes in the subsurface caused by an Earthquake or other waves, we are inherently observing a nonlinear elastic phenomenon. As a result, one way to better understand these interactions is to use laboratory experiments to study the interactions of waves. This can be done in a number of ways, and has been extensively studied over the past few decades. There is still much to learn however, including how these interactions are affected by cracks and fluids within the samples. In this work, we look at the nonlinear interaction of different wave types with cracks in different orientations in a set of sandstone samples. We find that there is a strong dependence on the nonlinearity on the relative orientations of the waves and cracks and present some preliminary explanations as to why this is likely to be the case and on how we can use this information to better characterize subsurface cracks. This will be put in the context of the broader field of experimental nonlinear elasticity.