

Shear strength and permeability of core samples from NanTroSEIZE Exp 315 and 316: Preliminary laboratory results

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In order to investigate the mechanical and transport properties of accreted sediments, we are planning to conduct laboratory shear and permeability experiments on samples acquired during IODP Exp 315 and 316. Shear experiments on disaggregated core samples will be conducted at strain rates from 10^1 to 10^3 /s and normal stresses of less than 2 MPa under initially dry and wet conditions using a rotary shear apparatus. We will particularly focus on how shear strength of accreted sediments changes as strain rate approaches to seismic rates. Permeability, porosity and storage capacity of accreted sediments will be determined at pressures from 5 to 200 MPa using a standard permeability apparatus. We also try to determine the permeability change before and after shear experiments. Combined with laboratory-determined mechanical and permeability data, we will discuss the effect of pore-pressure change associated with shear deformation and shear heating on dynamic fault motion during a subduction earthquake.