2007 Fall Meeting
Search Results

Cite abstracts as **Author(s) (2007), Title, *Eos Trans. AGU*, *88*(52), Fall Meet. Suppl., Abstract xxxxx-xx**

Your query was:
v43b-1366

HR: 1340h
AN: **V43B-1366**

Continental Assembly and Anisotropy Beneath the CANOE Array

AU *** Courtier, A M**
EM *cour0090@umn.edu*
AF *Department of Geology and Geophysics, University of Minnesota, 108 Pillsbury Hall 310 Pillsbury Drive SE, Minneapolis, MN 55455, United States*
AU **Gaherty, J B**
EM *gaherty@ldeo.columbia.edu*
AF *Lamont-Doherty Earth Observatory, Columbia University, 61 Route 9W, Palisades, NY 10964, United States*
AU **Revenaugh, J**
EM *justinr@umn.edu*
AF *Department of Geology and Geophysics, University of Minnesota, 108 Pillsbury Hall 310 Pillsbury Drive SE, Minneapolis, MN 55455, United States*

AB The Canadian Northwest Experiment (CANOE) is an array of nearly sixty broadband seismometers reaching from the Slave Craton in the Northwest Territories (NWT), across a series of Proterozoic orogens and the Canadian Rockies in the NWT, northern British Columbia, and southern Yukon, and across the Churchill Province south to Edmonton, Alberta. The array traverses a wide variety of continental settings, allowing the study of mantle variability associated with the formation of continental cratons and continental assembly over a time span of nearly 4 Ga. The close spacing of instruments in the CANOE array provides a detailed view of the mantle and lithosphere across these transitions. We examine splitting of the shear phases SKS, SKKS, and sSKS to study anisotropy beneath the region. The dataset consists of ~~70 teleseismic events of either magnitude > 5.6 and depth > 500 km or magnitude > 6.4 with depth < 500 km. All earthquakes were recorded at CANOE or nearby Canadian National Seismic Network stations between May 2003 and September 2005. Splitting times derived from multi-event station averages average ~1.4 s, and fast directions are coherent yet suggestive of strong variability of mantle anisotropy across the region. Stations on the craton show a dominant NE-SW fast direction that is roughly consistent with mantle flow dominated by plate motion. At the Cordillera boundary, fast directions flip abruptly to NW-SE, and continuing west across the Cordillera the fast directions rotate from NW-SE to roughly E-W before returning to NW-SE near the edge of the continent. These patterns are suggestive of dominant transpressional

deformation through the lithosphere during continental accretion. Within the craton, there is an anomalous cluster of stations with N-S fast directions; these stations sit astride an apparent ancient suture zone (subducted slab?) detected through previous scattered-wave and seismic reflection studies. We will explore the possible relationship between this slab-like feature and the anomalous anisotropy. In addition to describing the general patterns of anisotropy beneath the region, we also investigate variations in the fast directions and delay times suggestive of complexity in the region. A number of stations exhibit "null" behavior even in the multi-event average analysis, and individual event solutions are highly variable. Critical factors to be evaluated include back azimuth, the phase of interest, and frequency content.

DE: 7203 Body waves
DE: 7208 Mantle (1212, 1213, 8124)
DE: 7218 Lithosphere (1236)
DE: 8103 Continental cratons
DE: 8120 Dynamics of lithosphere and mantle: general (1213)
SC: Volcanology, Geochemistry, Petrology [V]
MN: 2007 Fall Meeting

New Search