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AN: **T22D-06 INVITED**

TI: Crust and Upper Mantle Structure Beneath Tibet and SW China From Seismic Tomography and Array Analysis

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AB: We will present a summary of the results of our seismological studies of crust and upper mantle heterogeneity and anisotropy beneath Tibet and SW China with data from temporary (PASSCAL) arrays as well as other regional, national, and global networks. In 2003 and 2004 MIT and CIGMR (Chengdu Institute of Geology and Mineral Resources) operated a 25 station array (3-component, broad band seismometers) in Sichuan and Yunnan provinces, SW China; during the same period Lehigh University (also in collaboration with CIGMR) operated a 75 station array in east Tibet. Data from these arrays allow delineation of mantle structure in unprecedented detail. We focus our presentation on results of two lines of seismological study. Travel time tomography (Li et al., PEPI, 2006; EPSL, 2007) with hand-picked phase arrivals from recordings at regional arrays, and combined with data from over 1,000 stations in China and with the global data base due to Engdahl et al. (BSSA, 1998), reveals substantial the structural complexity of the upper mantle beneath SE Asia. In particular, structures associated with subduction of the Indian plate beneath the Himalayas vary significantly from west Tibet (where the plate seems to have underthrusted the entire plateau) to east Tibet (where P-wave tomography provides no evidence for the presence of fast lithosphere beneath the Plateau

proper). Further east, fast structures appear in the upper mantle transition zone, presumably related to stagnation of slab fragments associated with subduction of the Pacific plate. (2) Surface wave array tomography (Yao et al., GJI, 2006, 2007), using ambient noise interferometry and traditional (inter station) dispersion analysis, is used to delineate the 3-D structure of the crust and lithospheric mantle at length scales as small as 100 km beneath the MIT and Lehigh arrays. This analysis reveals a complex spatial distribution of intra-crustal low velocity zones (which may imply that crustal-scale faults influence the pattern of middle/lower crustal flow). We will also show preliminary results of surface wave inversion for azimuthal anisotropy, which – combined with previous results from shear wave splitting (Lev et al., EPSL, 2006) – give insight into the deformation of the upper mantle beneath the area under study.

DE: 7205 Continental crust (1219)
DE: 7218 Lithosphere (1236)
DE: 7299 General or miscellaneous
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DE: 8120 Dynamics of lithosphere and mantle: general (1213)
SC: Tectonophysics [T]
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