

2003 Fall Meeting
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The Eastern Syntaxis Seismic Experiment

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AAcross the northeastern margin of the Indian plate in southeastern Tibet, the Himalayan orogen terminates abruptly as collisional processes responsible for the elevation of Tibet and the tectonics of the main Himalayan range are replaced by the strike-slip tectonics of the eastern Himalayan syntaxis. Modeling suggests that the syntaxis is a crustal manifestation of complex lithospheric dynamics associated with an 'indenter corner.' Incoming Indian lithosphere is partitioned into at least two components: deeper Indian lithosphere that continues north beneath Tibet, and shallower lithosphere that decelerates and, together with overthrust Asian lithosphere, enters the clockwise deformation regime of the eastern syntaxis. We are conducting a seismic experiment as part of a multidisciplinary study to better understand the interaction between surface processes and tectonics at an indenter corner, the

control of rheology on topography and lithospheric mechanics, and partitioning of deformation within the lithosphere. In July 2003 we deployed a 50 station broadband array across southeastern Tibet. The region is seismically active as evidenced in part by the recent M 5.6 event near Namche Barwa in the core of the syntaxis. The array will record local, regional, and teleseismic events over a 12 month period. The regional broadband array will be used to determine crustal and upper mantle structure and dynamics at the plate edge, to develop a more complete model of coupled crustal deformation and mantle flow in the syntaxial region. Nested within the regional array we deployed a dense, 20 station short period array to determine fault kinematics, and crustal structure and rheology in the immediate vicinity of the Namche Barwa Massif. Ultimately data analysis will include tomographic inversions for velocity and attenuation structure to constrain rheology, receiver-function analysis to determine primary structural boundaries, and earthquake location and focal-mechanism solutions, seismic moment analysis, and determination of shear-wave splitting parameters to look at strain.

DE: 8100 TECTONOPHYSICS

DE: 8102 Continental contractional orogenic belts

DE: 8107 Continental neotectonics

DE: 8120 Dynamics of lithosphere and mantle--general

DE: 8123 Dynamics, seismotectonics

SC: Tectonophysics [T]

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