2007 Fall Meeting
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HR: 11:20h
AN: **T22C-05**
TI: Metamorphism and deformation of the lower crust and crust-mantle interface at the eastern syntaxis of Tibet derived from converted seismic waves
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AB: In this study we examine the internal structure of the crust at the northeastern corner of the Indian-Asian collisional zone. This region marks a fundamental tectonic change, transitioning from collisional to escape tectonics, as it is influenced by the corner of the indenting Indian plate. Using detailed 3-d receiver function images the geometry and velocity structure of the crust is constrained through finite difference wave-form inversion. Our two fundamental observations are a dramatic change in lower crustal reflectivity across the end of the collisional zone and an anticlinal fold on the crust-mantle boundary that coincides with the Namche- Barwa/Gyala Peri antiformal basement massifs at the end of Himalayan arc. The observed change in lower crustal reflectivity coincides with the transition from classical central plateau collisional tectonics to the escape tectonics of the east. Associated with the along strike collision, a high velocity lower crustal layer with a P-velocity of 7.8 km/s is modeled beneath the southern Lhasa block. This layer extends to the north beneath the southern Lhasa block and terminates abruptly to the east about 100km to the west of the Namche-Barwa/Gyala Peri massifs. This layer is interpreted to be Indian lower crust that has subducted beneath Asian crust north of the Tsangpo suture and metamorphosed into eclogite. Further to the east beneath the Namche – Barwa/Gyala Peri massifs we image a north-south running 50 km wide, 10 km vertical step in the Moho. By modeling various crust- mantle geometries, sensitivity analysis was

performed to investigate whether this imaged step was generated by a crust-mantle interface with a discrete vertical step or a continuous folded structure. This feature can best be explained as a north-south trending, asymmetric, anticlinal fold on the crust mantle boundary. This fold on the crust-mantle interface correlates with a region on the surface that has undergone large amounts of uplift and exhumation.

DE: 7218 Lithosphere (1236)
DE: 8108 Continental tectonics: compressional
SC: Tectonophysics [T]
MN: 2007 Fall Meeting

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