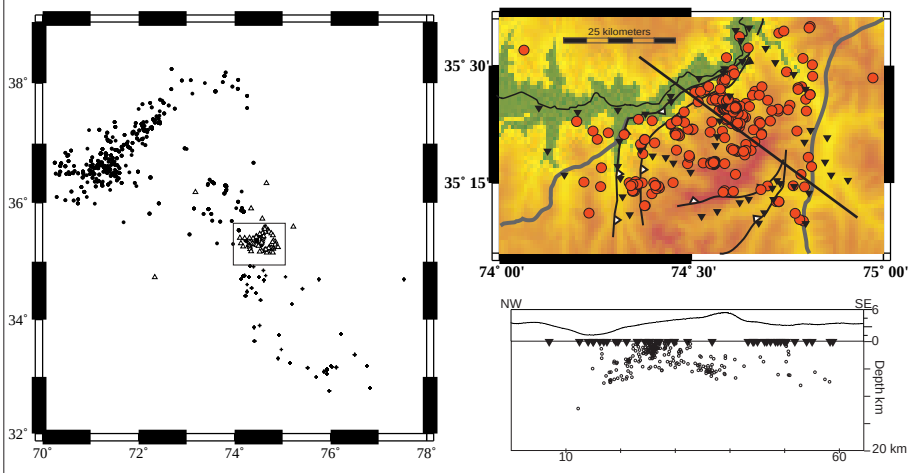

Figure 20a. Left: Broadband and short-period array (triangles), regional and local events from four month recording window. Right top: Detail of Nanga Parbat short period array and epicenters of local events. Base is topography. Seismometers were deployed in an ~60x60 km area at elevations from 1000-4500 m. Access west and east of massif was obtained along river valleys. Access to massif interior was obtained by trekking along glacial valleys. Abrupt cutoff in seismicity west of massif is associated with the Raikot fault, cutoff toward east is bounded by crest of massif. Right bottom: The base of seismicity forms a prominent antiformal shape beneath the massif and exhibits considerable structural relief, approximately 3 km in a lateral distance of 12 km. The apex of this antiform occurs at 5 km depth bsl and is offset approximately 10 km northwest of the topographic ridge crest. The base of seismicity deepens to 8 km bsl to the NW and SE mapping a thermal boundary and a transition between brittle and plastic deformation that takes place over an ~3km thick zone (Meltzer, et al., in review).

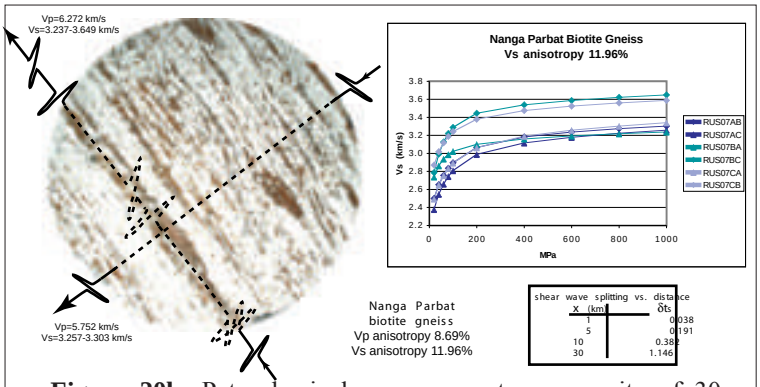

Figure 20b. Petrophysical measurements on a suite of 30 samples collected in and around the massif provide important insights into the degree of heterogeneity and velocity anisotropy associated with the rocks of Nanga Parbat and the adjacent Kohistan island arc terrane. Seismic velocity measurements of predominantly quartzofeldspathic gneisses show a relatively strong degree of anisotropy. Mean Vp measured in three mutually perpendicular directions for each sample ranges from 5.91-6.25 km/s at 1000 MPa (~35 km depth). Compressional wave velocity anisotropy in these samples averages 7% but anisotropy as high as 12.5% is observed. The observed degree of velocity anisotropy is primarily a function of biotite content and rock fabric strength. In some samples, propagation velocities in the foliation plane of the felsic gneisses overlap with mean velocities of the more mafic Kohistan terrane. These results provide important constraints on the interpretation of the velocity structure beneath the massif where in situ velocity variations can be due to both high strain zones in the crust as well as elevated temperature caused by rapid advection of rocks from depth. Mean shear wave velocities measured in a subset of cores is 3.4-3.55 km/s. Velocity anisotropy for shear waves averages 12.4% with a maximum of 21%. These results indicate that crustal anisotropy due to the development of pervasive rock fabric can be a significant contributing factor to shear wave splitting observations and have the potential to be used to map crustal starin at depth (Meltzer, Christensen, Long, in review).

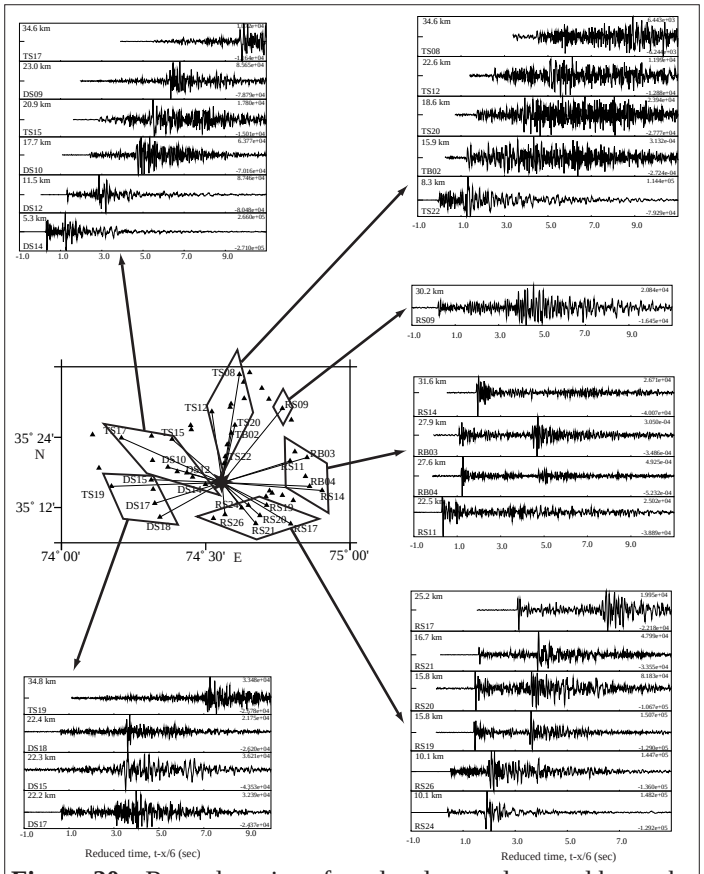

Figure 20c. Record sections for a local event laocated beneath the summit. Traces plotted by to azimuth and distance. Epicenter shown by the star, stations by triangles. While many stations show clear P and S phases, others do not. In particular note the appearance of arrivals at the Tato stations north of the event. In contrast, arrivals at these stations from other local events (following different ray paths) show clear and impulsive P and S phases. Also, note the attenuation of the S phase on several stations located east of the event (RS14 and RS11).