

# NORSAR

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## SEMIANNUAL TECHNICAL SUMMARY

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VII.6 A Case Study of Plates in Collision, the Lithosphere in the Hindu-Kush and Pamir Region

It has been recognized for several years that the Hindu Kush region contains a zone of anomalous seismicity which is not readily explained by any simple geometry of plate convergence. The shallow seismicity is most probably associated with the large-scale thrusting exhibited in the Himalayan orogeny, but beneath this lies an intermediate zone of very localized seismicity, perhaps 25 km wide and 300 km long, trending  $45^{\circ}$  from the shallow zone. We present a delineation of this zone by seismicity data, examine the regional P-wave velocity structure using 2 separate methods. The first of these uses the now familiar 3-dimensional velocity modelling procedure of Aki, Christoffersson and Husebye on arrival time data from a network of stations in the Pamir to produce a localized picture of the velocity structure in the anomalous seismic zone. The change in direction of the seismicity at around 150 km depth is echoed by an abrupt change in the velocity anomaly lineations in the same depth range. The projections to depths of 100 to 200 km of arrival time residuals at a group of more widely spaced WWSSN stations are used to augment the small-scale 3-D structure obtained by the first method with a less detailed, but large scale, 2-D model.

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