WIDE-ANGLE SEISMIC DATA ALONG THE ANCORP-PROFILE IN THE CENTRAL ANDES

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A total of ten wide-angle-sections, with shot-receiver distances of 110-230 km and receiver intervals of 90 m, were recorded between the Coastal Cordillera (N-Chile) and the Altiplano (S-Bolivia). In the forearc, velocities for the upper 20 km of 6.5 km/s (Coastal Cordillera) decrease towards the Longitudinal Valley. Here, Pm (k) reflections are observed at 50-55 km depth, clearly above the Nazca reflector at 60-65 km depth. In the arc region average velocity of the uppermost 20 km decreases to 5.9 km/s with respect to 6.1 km/s in the forearc. Here, as well as in the backarc region of the Altiplano, no observations could be obtained for depths of more than 20 km. An extraordinarily thick low-velocity layer with velocities ranging between 4.0 and 5.8 km/s is located in the upper 15 km of the Altiplano. At about 20 km depth, velocities increase to 6.0 – 6.4 km/s. The results of the wide-angle experiments give important constraints on the crustal geometry with respect to the reflectivity pattern from near normal incidence data. The path of the subducted oceanic crust can be followed down to roughly 80 km depth. Underneath the Western Cordillera, a low velocity zone lies above a Bright Spot which seems to be rather a refractor with positive velocity contrast than an inversion layer which would imply fluids or partial melts. Underneath the Altiplano, however, there are good reflectors correlating with velocity inversions and increased electrical conductivity suggesting partial melt concentration at intermediate depths of 10 to 20 km.