

TOMOGRAPHY OF THE ECUADORIAN ANDES FROM LOCAL EARTHQUAKE DATA OF THE 1995 LITHOSCOPE EXPERIMENT

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A temporary network of 54 Lithoscope stations was operated in Central Ecuador from December 1994 to May 1995. It included 19 3-component stations with 5 s sensors and 35 vertical short-period stations. To allow precise location of hypocenters and 3D tomography of the lithosphere, stations were installed on 2 sub-parallel E-W lines 250 km long intersected by 3 N-S lines 100 km long. The network crossed the whole Andean chain on a width of 100 km between Quito and Riobamba.

One of the main objectives of the experiment was to investigate the lithospheric structure of the Ecuadorian Andes from tomographic inversion of teleseismic traveltimes residuals. This goal was impossible to achieve due to the surprisingly small number of teleseismic events that were recorded. We suspect that this lack is due to the presence of a strongly attenuating layer in the mantle and/or the crust beneath the network. We hope that further investigations of local earthquake data will help in understanding the origin of this unexpected observation.

For the seismotectonic study, more than 1000 local events have been located using arrival times from the Lithoscope and the permanent stations of the Instituto Geofísico of Quito (Guillier et al., this volume). The subset of the best events will be used to invert simultaneously for hypocentral parameters and 3D velocity structure following the procedure described by Kissling et al. (1994) and using the iterative inversion method of Thurber (1983). We expect that, thanks to a better distribution of stations, the inversion of this dataset will significantly improve the tomographic image computed by Prévot et al. (this volume) using arrival times at permanent stations.

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