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Alpine Longitudinal Profile, 1975 - The Experiment and first Results

From September 8th to 20th, 1975 refraction seismic measurements were carried out in close European cooperation on a long range profile along the strike of the Alps between Hungary and France. 20 shots from 9 different shotpoints were recorded along a main line 850 km long as well as on a number of fans and additional shorter profiles. Figure 1 shows the location of shotpoints and profiles of ALP,1975 within a simplified map of Bouguer gravity. With 193 recording stations and over 200 persons participating ALP 1975 was the largest experiment of that kind ever to be undertaken in the Alps.

The aim of the experiment was twofold: to determine the velocity depth structure of the crust beneath the axis of the Alps from data essentially free of the influence of strong horizontal velocity variations and to probe the structure of the lower lithosphere.

First results will be presented in the form of velocity-depth functions, which are generally characterized by a marked velocity inversion at depths varying between some 18 to 30 km. In some areas a second velocity inversion seems to exist in the lower crust.

Furthermore, long range data indicate a fine structure of the lower lithosphere, which at the present time cannot yet be resolved in any detail, since crustal structure and accordingly crustal traveltimes have not yet been determined accurately enough over the whole length of the profile.

The newly determined velocity-depth-distributions form a good basis for reinterpretations of earlier measurements. As an example of such a reinterpretation a crustal cross section will be presented for the line Eschenlohe - Trieste.

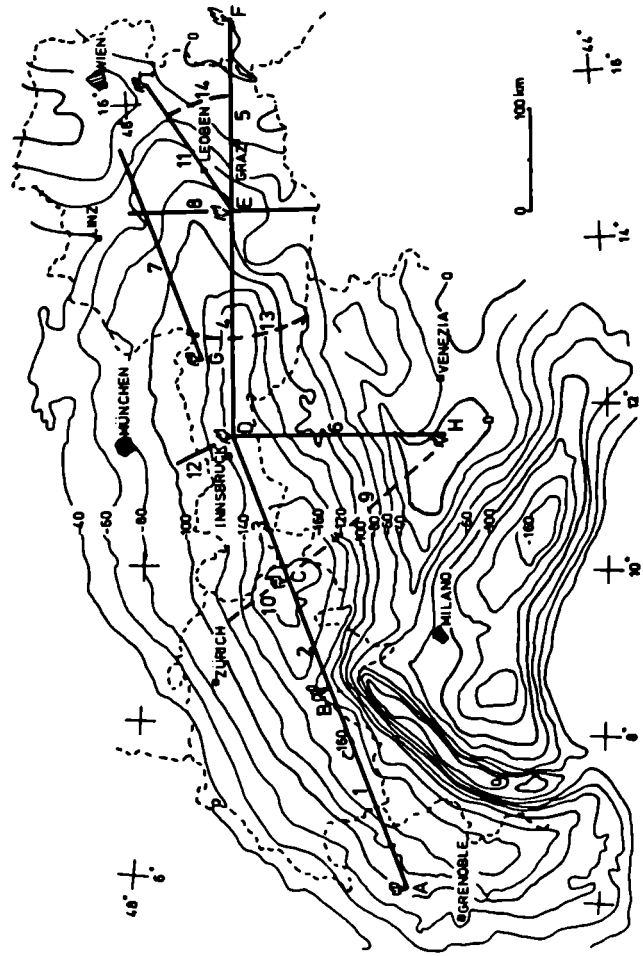

Fig.1. ALP 1975: Location of shotpoints and recording lines within a simplified map of Bouguer gravity. Note how the main line between shotpoints A and F follows the gravity minimum.