Geophysical Research Abstracts, Vol. 9, 03627, 2007
SRef-ID: 1607-7962/gra/EGU2007-A-03627

The seismic velocity structure of the continental crust of SW-Iberian Peninsula

I. Palomeras (1), I. Flecha (1), R. Carbonell (1), A. Pérez-Estaún (1), F. Simancas (2), F. González-Lodeiro (2).

(1) CSIC-Inst. Earth Sciences, Spain. (2) Dept. Geodinamica, Univ. Granada, Spain.

(ipalomeras@ija.csic.es / telf: 0034 93 409 54 10)

The velocity models obtained from two wide-angle seismic surveys acquired in the SW-Iberian Peninsula have provided new constraints on the lithosphere of the Variscan Orogen in the area. These models are approximately 300 km long and more than 70 km depth. The velocity function obtained from these velocity models is relatively high when compared with the standard average crustal velocity, specially at middle crustal depths. A comparison between the laboratory measurement and our estimated velocity values was carried out in order to obtain the crustal and the upper mantle composition. Conventional forward model interpretation constraints an upper crust characterized by a gradient velocity from 5.2 km/s to 6.5 km/s at 13-15 km depth. These velocities are compatible with the laboratory measurements of felsic igneous and metamorphic rocks (granite, slates, quartz monzonnite, charnockite, granodiorite, tonalite and quartz diorite). Some of them outcrop along the transects. Beneath this and up to 25 km depth (middle crust) velocity range from 6.2 km/s to 7.0 km/s with some lateral variability. The models show a high velocity (6.8-7.0 km/s) lenses at this level. These high velocities correspond to rocks with relatively high mafic content, as amphibolite, mafic granulite, greenschist basalt, anorthositic granulite, gabbronorite. The lower crust, from 25 to 33 km depth, velocities are within the range of 6.8-7.1 km/s. These velocities match with laboratory velocities of amphibolite, anorthosite, gabbrosn, gabbroic anorthosite, pyroxene granulite, stronalite gneiss. The upper mantle beneath the Moho up to 67 km depth approximately velocities range from 8.1-8.3 km/s. It probably includes ultramafic units composed of interlayering dunite, hazburgite, peridotite, and eclogites, with a dominant composition of pyroxenites. The velocity increments at 67 km depth to 8.4 km/s. This velocity jump could be explained

by an increase in dunite and eclogite. All these data reveals new aspects related to the lithospheric evolution of this transpresive orogen, and allows us to attempt an interpretative cross-section of the upper lithosphere in SW-Iberia.