Geophysical Research Abstracts
Vol. 13, EGU2011-2379, 2011
EGU General Assembly 2011
© Author(s) 2011

Crustal density structure from gravity modelling beneath Himalaya and Lhasa terranes, Tibet

Zhongjie Zhang (1), Sufang Zhang (1), and Carla Braitenberg (2)

(1) State Key Laboratory of Lithospheric Evolution, Institute of geology and Geophysics, Chinese Academy of Sciences (zjzhang1@yahoo.com), (2) Department of Geosciences, University of Trieste, Via Weiss, I-34127 Trieste, Italy (berg@units.it)

The Himalaya, Lhasa terranes are geologic units which constitute the south and central Tibetan plateau. They are the product of the deep-reaching process of mountain building due to the convergence and collision of the Indian and Eurasian plates. We define a 3D density model beneath these tectonic terranes constrained by a review of all available active seismic and passive seismological results on the velocity structure of crust and lower lithosphere in Tibet. From our final density model, we infer that the present subduction-angle of the Indian plate is small, but presents some variations along the west-east extension of the orogenic belt. The dip angle of the Moho interface is about 8-9°in the eastern and western part of the orogenic belt, and about 16°in the central part. Integrating crustal P-wave velocity distribution from wide-angle seismic profiling, geothermal data and our crustal density model, we infer a crustal composition model, which is composed of an upper crust with granite- granodiorite and granite gneiss beneath the Lhasa terrane; biotite gneiss and phyllite beneath the Himalaya, a middle crust with granulite facies and possible pelitic gneisses, and a lower crust with gabbro-norite-troctolite and mafic granulite beneath the Lhasa terrane.