



Tectonics of Querétaro and San Juan del Río valleys (Central Mexico): gravity data analysis

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Querétaro and San Juan del Río valleys represent NNW-SSE oriented graben located between cities Querétaro and San Juan del Río, Central Mexico. A geological-geophysical study has been carried out in this area during 2000-2005 years. There were realized about 3000 gravity field reading points. The points are grouped in 15 profiles which cover all the area and focused lengthways (NNW-SSE) and across (WSW-ENE) of these valleys. The field investigation was carried out using the gravity meter CG-3 with a reading resolution of 0.005 mGal. Data processing included a standard set of corrections such as short time drift correction, latitude effect, elevation (free air) and Bouguer effects have been applied. Various tools such as filtering (low pass, high pass and bound pass), up and down continuation, first and second derivations, etc., were applied to observed gravity data. As usual the agreement between interpreted models (calculated data) and observed corrected data was very good. The Bouguer gravity field is characterized by strong coincidence between topography and anomalies configuration. In central parts of valleys the chains (NNW-SSE) of negative residual anomalies are observed. From northeast and a southwest this area is limited by zones of high gradients. Obviously, these high gradient zones are connected with deep earth's crust faults, limiting both grabens. The graben of Querétaro is flanked to the East and West by two NS regional faults and in the North and South by two fairly oriented EW faults. Besides on the basis of a gravity data it is possible to mapping the other fault system focused perpendicularly (SW-NE) to an axis of grabens. These faults possibly have smaller depth of origination. Thickness of sedimentary cover in the deepest parts of grabens reaches about 1.5 km and more.