



Gravity study of the Middle Aterno Valley

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A gravity study was carried out to identify the geological and structural features of the Middle Aterno Valley, and intramontane depression in the central Appennines, which was targeted to assess the seismic hazard of the city of L'Aquila and surrounding areas, after the Abruzzo 2009 earthquake.

Gravity anomalies have been used for the construction of a 3D model of the area, and gravity data for the construction of Bouguer and residual anomaly maps. These data, together with geological surface data allowed for the understanding of the Plio-quaternary tectonic setting of the basins.

The study area has been differentiated into different domains with respect to structural and morphological features of different styles of faults.

Geology and gravity data show that the local amplification phenomena are due to the fact that the historical center of L'Aquila was built on a coarse breccias (debris-flow deposits with decameter scale limestone blocks) overlying sandy and clayey lacustrine sediments. As these sediments have a low density, gravity prospecting very easily identifies them. Residual anomalies, showing a relative gravity low corresponding to the historical center of L'Aquila, and surrounding areas, indicated that these sediments are up to 250 m-thick.

Gravity prospecting also revealed the uprooting of the reliefs which outcrop in the area of Coppito. These reliefs, practically outcrop in the middle of the basin. Here, the gravity anomalies are negative and not positive as would be expected from outcropping geological bedrock.