

Microgravity Survey to Evaluate Earthquake Effects on a Dam Site in Iraq

A total of 324 microgravity measuring points were carried out on Derbendikhan rockfill Dam, 230km NE Baghdad, to evaluate the possible effects resulted in 7.3 magnitude earthquake hit the Iraqi-Iranian borders, 40km from the site, on Nov. 12, 2017. The site lies within the high folded zone which is a part of the Western Zagros Fold – Thrust Belt. A gravimeter Model CG-5 was used in this survey, where all the necessary corrections were applied on the raw data to calculate the Complete Bouguer Anomaly map. A 2m upward continuation filter was applied on Bouguer map for regional field determination that used to calculate the residual anomaly map. The residual map showed numerous negative and positive gravity anomalies that reflect subsurface heterogeneity in density distributions. Power spectrum analysis of Bouguer map showed six depth slices of gravity sources; 0.95m, 1.75m, 5.5m, 12.5m, 21m and 55m. The results showed two prominent anomalies appear close to the right bank on 21m depth; the first is a positive anomaly of 8m long, and the second is a negative anomaly of 14m long. These positive and negative anomalies suggest high and low-density zones coincide with compression and extension stresses resulted in the earthquake energy.

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