Gravimetry in Geothermal Exploration

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A review of available information from geothermal areas in a number of countries shows that gravimetry is a highly effective exploration tool useful in three different ways: (a) location of thermal convection plumes which are characterized by small positive gravity anomalies, and are associated with density increase of the host-rocks; (b) location of plutons or batholiths which might serve as a heat source (magma chamber); and (c) location of faults which often control the thermal fluid flow and distribution patterns.

Thermal plutons are often characterized by negative gravity anomalies. The negative anomaly may be due to inherent density differences between the intruded rock and the host rock, thermal expansion effect, or a combination of both.

Examples of computations of mass difference, energy-content difference, and a combination of both are shown for sites in the Geysers, Imperial Valley, Hungary, and Ethiopia.