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Density Anomalies in the Subsurface of Mars Determined from the Gravity Field JUAN HINOJOSA[1], Texas AM International University — The high degree and order (n,m >20) Bouguer gravity field of Mars was used to calculate the subsurface density anomalies in eleven study areas associated with past volcanic activity. The sources of the gravity field were modeled with a Pratt layer of uniform thickness. A series of density anomalies consistent with the gravity field in each area was generated by varying the thickness and depth of the Pratt layer. The densities associated with the gravity lows in each area were then analyzed to determine the combinations of model parameters that would yield densities equal to the density of basalt magma (2700 $kg\ m^{-3}$). The depth to sources was constrained by observing the rate of decay of the near-surface, short-wavelength Bouguer gravity power spectrum. Using the depth to sources, a maximum Pratt layer thickness coinciding with the 2700-$kg\ m^{-3}$ density curve was obtained. The results indicate that subsurface densities corresponding to basalt magma are consistent with the observed Bouguer gravity field in all of the study areas for values of Pratt layer thickness of ˜7–16 km. Furthermore, the results appear to suggest that Mars may still contain isolated pockets of basalt magma in its subsurface.

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