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Crustal Structure and Internal Differentiation of the Dwarf Planet Ceres

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We used topographic and gravity data returned by the Dawn mission up to degree and order 14 of a spherical harmonic expansion to constrain the crustal structure and the deep interior of Ceres. The gravity and topography data suggest a low degree of internal differentiation, but also indicate the presence within Ceres of a density boundary between the crust and the deeper interior. The surface topography of Ceres is mainly compensated by lateral variation in thickness of the crust. The overall Airy compensation of the crust indicates that Ceres' interior was warmer in the past where a viscous and ductile deforming region and/or subsurface ocean could have subsisted for some period. A relict subsurface ocean could still be present. We also found that the fast rotation of Ceres has deformed its shape.