



Mercury's interior structure

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Depth-dependent interior structure models of Mercury have been calculated for several plausible chemical compositions of the core and of the mantle. The core is assumed to consist mainly of iron and an unknown amount of sulfur. We considered a plausible range in sulfur concentration and constructed Mercury models in different phases of its core evolution, from entirely liquid to entirely solid cores. Mantle compositions consistent with the observed low surface FeO and corresponding to different formation histories have been used to construct mantle mineralogy models. Different temperature profiles, resulting from thermal evolution models, have been considered.

Large advances in our knowledge of Mercury's interior are expected from geodetic observations of the gravity field, the rotation, and the tides of Mercury. Both ground-based facilities and the space missions MESSENGER and BepiColombo will contribute to the determination of the polar principal moment of inertia of the entire planet and of the mantle, and the tidal Love numbers. The sensitivity of these data to key interior parameters has been studied in order to assess the minimum precisions on the data required and to quantify the expected improvement in our knowledge of Mercury's interior.