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(1) CERES: STUDY OF THERMAL CONVECTION IN THE MANTLE AND ITS MECHANICAL EFFECTS

Michelangelo Formisano, michelangelo.formisano@iaps.inaf.it
INAF - IAPS Rome, Rome, Italy
Costanzo Federico, costanzo.federico44@gmail.com
INAF-IAPS, Rome, Italy
Maria Cristina De Sanctis, mariacristina.desanctis@iaps.inaf.it
IAPS/INAF, Rome, Italy
Gianfranco Magni, gianfranco.magni@iaps.inaf.it
INAF, Rome, Italy

Ceres is the largest body of the Main Belt, which is characterized by a huge abundance of water ice in its interior. This feature is suggested by its relatively low bulk density (2162 kg m-3, Russell et al. 2016, Park et al. 2016) and by several geological and geochemical evidences (specific minerals or salts produced by acqueous alteration, icy patches on the surface, lobate morphologies interpretable as surface flows (De Sanctis et al. 2016, Carrozzo et al. 2018, Raponi et al. 2018, Zolotov 2017 and Schmidt et al., 2017). Ceres is partially differentiated as suggested by its normalized moment of inertia, 0.37 (Park et al. 2016). A typical internal structure proposed for Ceres is: a rocky core (300-350 km), an icy (or muddy) mantle (100-150 km) and a rocky crust some kilometers in depth (eg. Mc Cord Sotin 2005, Neveu Desch, 2015). The temperature gradient across the mantle, estimated through numerical modelling (e.g. McCord Sotin 2005, Neveu Desch 2015) would be large enough to initiate a thermal convection in the mantle. Since the mantle is not uniquely defined from a composition point of view, in this work we explore how the composition and, in particular the "degree" of muddiness of the mantle, can influence the characteristic of thermal convection. We also estimate the thickness of the top conductive boundary layer and the mechanical stress, which can cause its deformation.

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