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Solubility and erosion of icy cores in giant planets HUGH WILSON, BURKHARD MILITZER, University of California Berkeley — The core-mantle boundary of a giant planet consists of an interface between dense rock/ice below and fluid hydrogen-helium above. Whether this phase boundary remains stable, however, or whether the core material is dissolved and redistributed throughout the interior, remains unknown, and has major consequences for planetary interior and formation models. In this work we use density functional theory molecular dynamics calculations to compute the free energy of solubility for the icy components of the core into fluid hydrogen, to investigate whether solubility is thermodynamically preferred at the extreme temperature and pressure conditions prevalent at the core-mantle boundaries of Jupiter and Saturn. The consequences for Jupiter and Saturn, as well as for giant exoplanets, will be discussed.

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