

Abstract Submitted  
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**Phase stability of mixtures at extreme conditions: implications for the interior structure of the Outer Planets** SEBASTIEN HAMEL, Lawrence Livermore National Lab — The unusual magnetic fields of the planets Uranus and Neptune represent important observables for constraining and developing deep interior models. Models suggests that the non-dipolar and non-axial magnetic fields of these planets originate from a thin convective and conducting shell of material around a stratified fluid core. We present a computational study of the physical properties of a fluid compositionally similar to what is expected in the interior of Uranus and Neptune. Our diffusivity and conductivity results suggest that the core cannot be well mixed if it is to generate non-axisymmetric magnetic fields. The simulations highlight the importance of chemistry on the properties of this complex mixture, including the possible formation of carbon and nitrogen clusters. We present results concerning the overall phase stability of the mixture under conditions relevant to the planetary interiors.

Sebastien Hamel  
Lawrence Livermore National Lab

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