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Simulations of dense hydrogen and hydrogen-helium mixtures at conditions relevant to gas planet interiors[1] ISAAC TAMBLYN, Dalhousie University, JAN VORBERGER, Carnegie Institution of Washington Geophysical Laboratory, BURKHARD MILITZER, Carnegie Institution of Washington Geophysical Laboratory, STANIMIR A. BONEV, Dalhousie University — The principle components of all gas giants are hydrogen and helium. In order to improve models describing the formation and evolution of planets such as Jupiter and Saturn, we investigate the properties of these materials under extreme conditions. *Ab initio* molecular dynamics simulations are performed on both pure hydrogen and hydrogen-helium mixtures. The equation of state and structural properties of these liquids are determined at characteristic temperatures, pressures, and mixing ratios relevant for the interior of Jupiter-like planets. Results are compared with previous investigations, both experimental and theoretical, with improvements highlighted. In particular, effects originating from the dissociation of molecular hydrogen are discussed.

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