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On the structure of compressed liquid hydrogen[1] STANIMIR BONEV, Lawrence Livermore National Laboratory, Livermore, CA 94550, ISAAC TAMBLYN, Department of Physics, Dalhousie University, Halifax, N.S., Canada — We report first-principles results that predict the existence of a hitherto unknown short-range orientation order in both molecular and non-molecular liquid hydrogen. The appearance of this order provides a physical explanation for the sharpness of the dissociation transition, and has implications for the accuracy of previous equation of state calculations and the expected finite-temperature crystalline phases of hydrogen. In addition, we present results mapping the dissociation transition line.

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