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Title

Pressure behavior of the sound velocity of liquid water at room temperature in the terahertz regime

Source

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Abstract

The pressure evolution of the sound velocity in liquid water in the terahertz regime, c , between 0.05 and 0.88 GPa, at room temperature, has been investigated by synchrotron inelastic x-ray scattering in a diamond anvil cell. We confirm previous results showing that c increases with density much less than the adiabatic sound velocity c_s , which is reasonably related to the known structural modifications in the hydrogen bond network. At variance with a previous study where an anomaly was found in the density evolution of c -most likely due to the nonisothermal character of the study-the present work reveals a smooth behavior of c , which could provide a useful constraint to the current theories on liquid water. (15 References).