

SIT039-11

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## Measurement of acoustic velocity in liquid water at high pressures: Application to water at lower mantle conditions

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Sound velocities in liquid water were measured along the melting curve to 25 GPa and 900 K using a laser heated diamond anvil cell with a combined system of Brillouin scattering and synchrotron X-ray diffraction at SPring-8/BL10XU. The sound velocities obtained in liquid water at high pressures and melting temperatures were converted to density using Murnaghan's equation of state by fitting a parameter of the pressure derivative of bulk modulus at 1 GPa. The results are in good agreement with the values predicted by a previously reported equation of state for water based on sound velocity measurements. The equation of state for water obtained in this study could be applicable to water released by dehydration reactions of dense hydrous magnesium silicate phases in cold subducting slabs at lower mantle conditions.

Keywords: water, sound velocity, Brillouin scattering, synchrotron X-ray diffraction, diamond anvil cell