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Neutron scattering experiment on water under high pressure and temperature

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We plan to carry out neutron scattering experiments on liquid water under high pressure and temperature using a high pressure neutron diffractometer, PLANET, which will be available in fall this year, at J-PARC. Our previous synchrotron x-ray diffraction experiments and molecular dynamics simulation studies have revealed that structure of liquid water changes drastically under high pressure and temperature. But experimental observation of hydrogen is limited and neutron experiments are necessary to understand pressure and temperature dependence of hydrogen bonds in water. In this presentation, scientific background and the present status of target, design of an high-pressure assembly, methods for data analysis will be shown.

[1] Y. Katayama, T. Hattori, H. Saitoh, T. Ikeda, K. Aoki, H. Fukui, and K. Funakoshi, Phys. Rev. B 81, 014109 (2010)

[2] T. Ikeda, Y. Katayama, H. Saitoh, and K. Aoki, J. Chem. Phys. 132, 121102 (2010).

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