（ ※本報告書は英語で記述してください。ただし、産業利用課題として採択されている方は日本語で記述していただいても結構です。 ）

CROSS TOKAI **Experimental Report** J-PARC	承認日 Date of Approval 2014/7/29 承認者 Approver Takanori Hattori 提出日 Date of Report 2014/7/25
課題番号 Project No. 2013B0105 実験課題名 Title of experiment Exploring stability region of ice under low temperature and high pressure – Is iceXV really stable phase of ice? - 実験責任者名 Name of principal investigator Kazuki Komatsu 所属 Affiliation Graduate School of Science, The Univ. of Tokyo	装置責任者 Name of Instrument scientist Takanori Hattori 装置名 Name of Instrument/(BL No.) PLANET 実施日 Date of Experiment 2014/2/27–2014/3/6

試料、実験方法、利用の結果得られた主なデータ、考察、結論等を、記述して下さい。(適宜、図表添付のこと)
Please report your samples, experimental method and results, discussion and conclusions. Please add figures and tables for better explanation.

1. 試料 Name of sample(s) and chemical formula, or compositions including physical form.

DCl–D2O solution (0.01 mol/L) + Pb (0.0477 g)

2. 実験方法及び結果 （実験がうまくいかなかった場合、その理由を記述してください。）
Experimental method and results. If you failed to conduct experiment as planned, please describe reasons.

Experimental path (PT) is shown in Fig. 1. First, powder sample of ice VI was obtained through compression at 200 K, cooling down to 80 K, and then T was up and down at 0.4 GPa and 0 GPa.

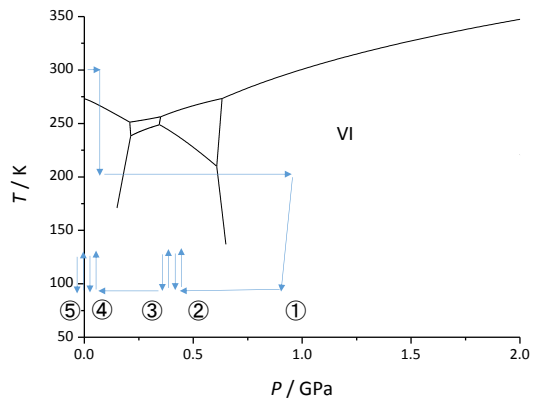

Fig. 1. PT path of this experiment. PT was controlled by the MITO system (Komatsu et al., 2013); temperature was monitored by K-type t.c. and pressure was estimated by the EOS of Pb (Fortes et al., 2007; 2012).

2. 実験方法及び結果（つづき） Experimental method and results (continued)

Respective powder diffraction pattern were shown in Fig. 2. Peaks in ①—④ can be all indexed as ice VI, while the peaks in ④ are broadened compared to ③. Through ④ to ⑤, c/a ratios are increasing, which was shown in the previous study by Salzmann et al. (2009), indicating the ordering of ice VI. Correspondingly, some tiny peaks (allows in Fig. 2) which can be attributed to ice XV, the ordered phase of ice VI, are observed in ⑤. On the other hand, no strong evidences were found in ①-④, suggesting that the phase transition boundary between ice VI and XV could have a negative slope or too sluggish phase transition under pressure.

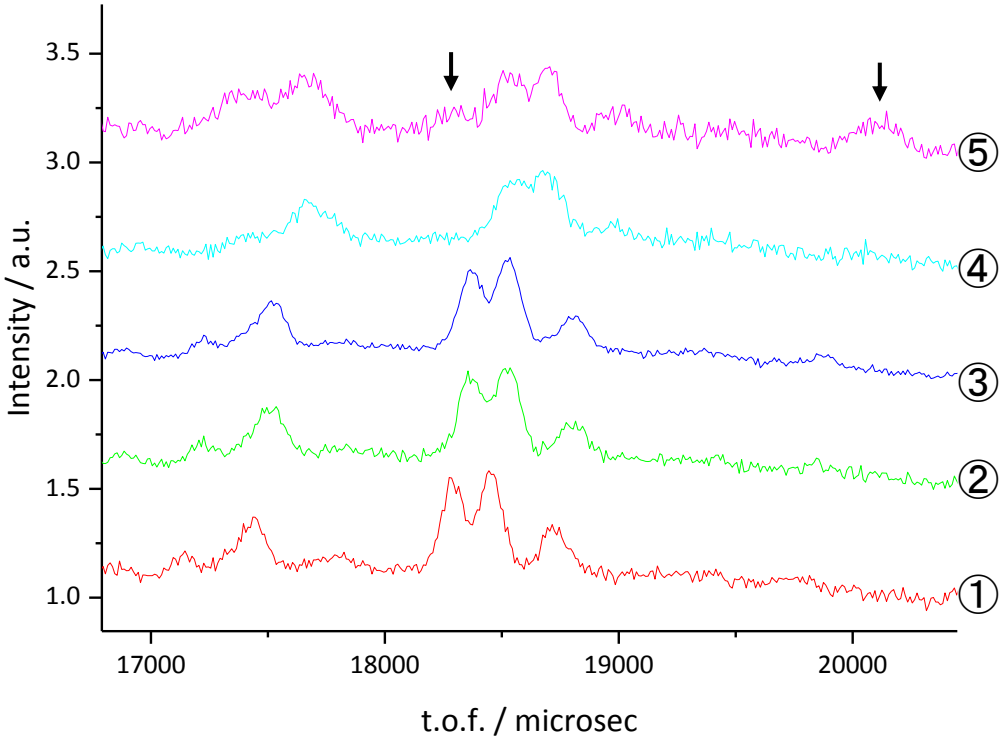

Fig. 2. Powder neutron diffraction patterns corresponding to the PT conditions shown in Fig. 1. Black allows denote the peaks derived from ice XV.

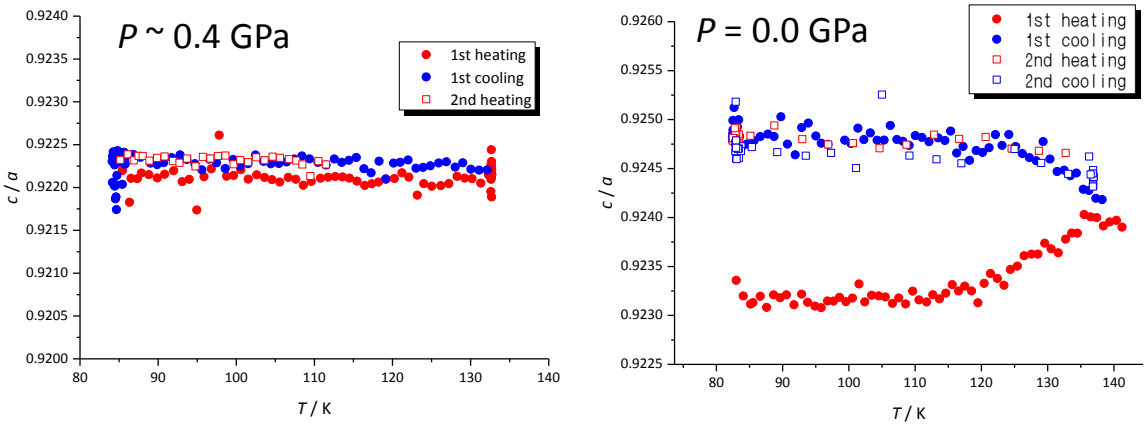

Fig. 3. *c/a* ratios for ice VI at 0.4 GPa (left) and ambient pressure (right).