


実験報告書様式(一般利用課題・成果公開利用)

(※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。)

 <b>Experimental Report</b> 	承認日 Date of Approval 2017/12/9 承認者 Approver Jun-ichi Suzuki 提出日 Date of Report 2017/10/1
課題番号 Project No. 2017A0228 実験課題名 Title of experiment Successive Magnetic Transitions in a Polar Magnet GaV4Se8: Exploration for Possible Neel-type Skyrmions 実験責任者名 Name of principal investigator Taka-hisa Arima 所属 Affiliation University of Tokyo / RIKEN	装置責任者 Name of Instrument scientist Jun-ichi Suzuki 装置名 Name of Instrument/(BL No.) TAIKAN / BL15 実施日 Date of Experiment 14th-16th June, 2017

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.  Three single crystals of GaV4Se8
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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.  The crystals were attached on an aluminum plate with their [111] axis perpendicular to the plate. The plate was installed in a cryostat equipped with a 4-tesla transverse superconducting magnet. Small-angle neutron scattering with [111] incidence was recorded at several temperatures and magnetic fields.  First, the sample was cooled down to 2 K without an external magnetic field. Six-fold diffraction pattern as shown in Fig. 1 was observed. Then a magnetic field of 1 T was applied parallel to the [111] axis and the field was decreased to 120 mT. The six reflection peaks were narrowed as shown in Fig. 2. Although we could not draw any clear conclusion, similar behaviors are commonly observed across the magnetic transition from helix to skyrmion lattice phase in other skyrmion-lattice systems. Next, the sample was cooled from above Neel temperature down to 13 K in a magnetic field of 30 mT in the [1 -1 0] direction and then the magnetic field was switched off. Twofold diffraction pattern as shown in Fig. 3 was observed. This indicates that cycloid phase with $Q//[1\ 1\ -2]$ is stabilized in the magnetic field. However the pattern was changed into six-fold pattern by applying a magnetic field of 100 mT along [111], as shown in Fig. 4.
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## 2. 実験方法及び結果(つづき) Experimental method and results (continued)

This can be ascribed to the emergence of triangular skyrmion lattice.

