	承認日 Date of Approval Jan. 4, 2015 承認者 Approver J. Suzuki 提出日 Date of report 2014/7/30
実験課題番号 Project No. 2013I0103 実験課題名 Title of experiment Characterization of polarized pulsed neutron beam at TAIKAN 実験責任者名 Name of principal investigator Kazuki Ohishi 所属 Affiliation CROSS	装置責任者 Name of Instrument scientist Jun-ichi Suzuki 装置名 Name of Instrument/(BL No.) BL15 TAIKAN 利用期間 Dates of experiments 2/24 10:00 - 2/26 9:00

1. 研究成果概要(試料の名称、組成、物理的・化学的性状を明記するとともに、実験方法、利用の結果得られた主なデータ、考察、結論、図表等を記述してください。)

Outline of experimental results (experimental method and results should be reported including sample information such as composition, physical and/or chemical characteristics.

The beamtime of this project was allocated 4 days and 2 days in 2013A and in 2013B, respectively. However, the beamtime in 2013A was canceled because of the accident of J-PARC Hadron Experimental Facility. As a result, our beam time was reduced and only 2 days was allocated in total. Therefore, we gave up to perform the planned experiments of the characterization of polarized neutron beam because of the shortage of the beamtime, we have performed the experiments to get the reference data using polarized neutron beam at TAIKAN.

We reported that a chiral inorganic compound MnSi forms a chiral magnetic soliton lattice under an applied magnetic field [1]. In the experiments, we have observed higher order magnetic satellite peaks only in multi-domain helimagnetic phase. We concluded that the difference in the intensities at the higher order satellite indicate that the sense of the spiral structure and the chiral magnetic soliton lattice is the same with that of the crystalline and helimagnetic structures. This time, we have performed polarized small angle neutron scattering experiment using the same single crystal of MnSi with several applied fields in order to study the magnetic field dependence of the chiral soliton lattice.

We have observed both the helimagnetic satellite peaks and the higher order satellite peaks with the same experimental setup of the previous experiments. While the detailed analysis is underway, a preliminary result is shown in Figure 1. We observe the increase of the ratio, which is the intensity of higher satellite peak  $I(2q)$  divided by that of satellite peak  $I(q)$ , with increasing field. It suggests that the chiral soliton lattice develops with increasing field. The results of the detailed analysis and arguments will be published elsewhere.

1. 研究成果概要(つづき) Outline of experimental results (continued).

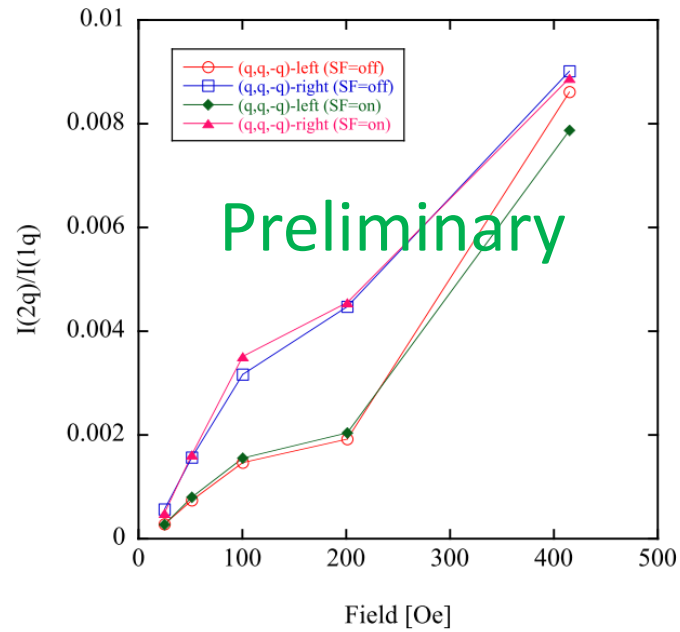


Fig. 1: Magnetic field dependence of the intensity of the higher order magnetic satellite peak ( $2q$ ) normalized by that of the helical magnetic peak ( $1q$ ).

Reference:

[1] Y. Kousaka *et al.*, JPS Conf. Proc. **2**, 010205 (2014).

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