

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。)

 	承認日 Date of Approval 2018/1/12 承認者 Approver Takashi Ohhara 提出日 Date of Report 2018/1/12
課題番号 Project No. 2017A0222 実験課題名 Title of experiment Single crystal neutron diffraction of $Y_3Fe_5O_{12}$ 実験責任者名 Name of principal investigator Shin-ichi Shamoto 所属 Affiliation Japan Atomic Energy Agency	装置責任者 Name of responsible person Takashi Ohhara 装置名 Name of Instrument/(BL No.) SENJU(BL-18) 実施日 Date of Experiment 2017/06/05, 09:00-06/10, 9:00

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.
<p>A single crystal of $Y_3Fe_5O_{12}$</p>

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.
<p>A single crystal of $Y_3Fe_5O_{12}$ (YIG) grown by traveling solvent floating zone method was measured at about 295 K under a magnetic field ($B \sim 0.1$ T) along [111]cubic. The magnetic field at the sample position was measured by a Hall effect sensor. Intensities of 727 reflections were well refined with a trigonal space group (R-3, No. 148; hexagonal setting). Observed nuclear and magnetic Bragg peak intensities are shown in Fig. 1 as a function of calculated intensities. The refined crystallographic parameters with reliability factors were $R_F^2 = 9.85\%$ and $R_F = 7.07\%$. The obtained nuclear and magnetic structure is shown in Fig. 2.</p>

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

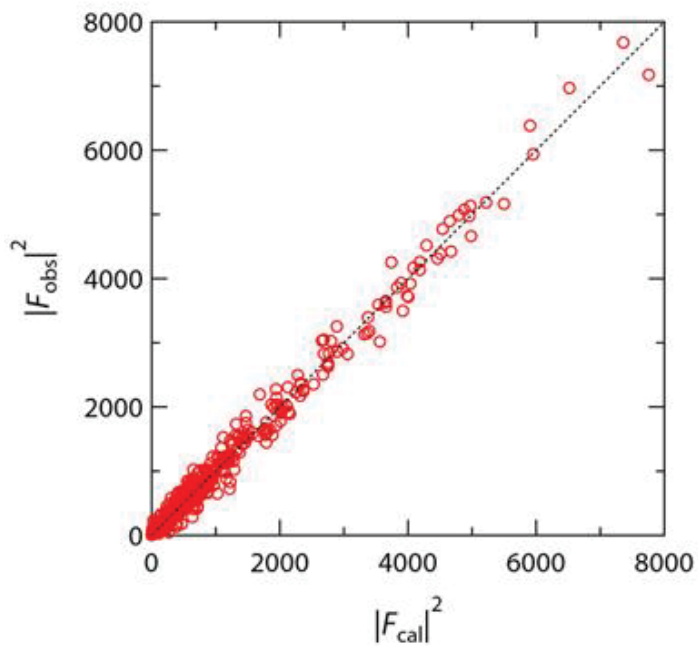


Fig. 1. Observed nuclear and magnetic Bragg peak intensities as a function of calculated intensities with a trigonal space group (R-3).

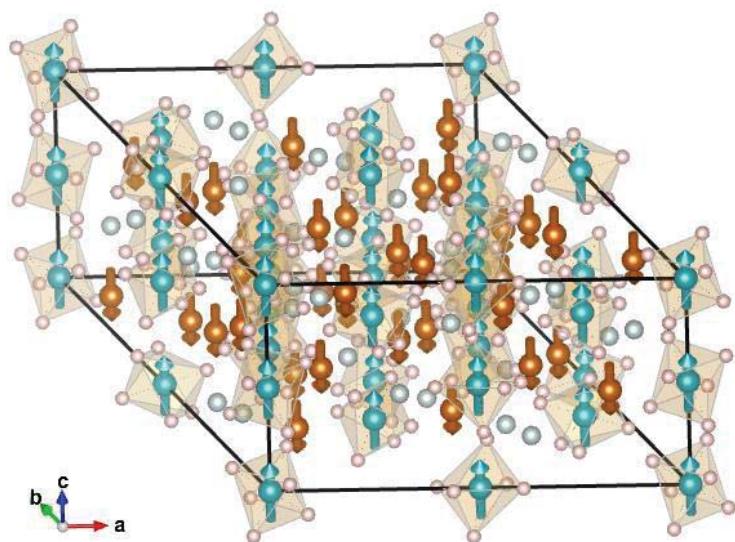


Fig. 2. Obtained nuclear and magnetic structure of YIG in a trigonal unit cell of R-3.