



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 2017/4/7 承認者 Approver Kaoru Shibata 提出日 Date of Report 2016/12/30
課題番号 Project No. 2015A0177 実験課題名 Title of experiment Spin-orbital mode coupling measurement in BaFe ₂ As ₂ single crystal by ultrasound 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 Kaoru SHIBATA 装置名 Name of Instrument/(BL No.) DNA(BL-02) 実施日 Date of Experiment 2016/12/11, 21:00-12/14, 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. Single crystals of BaFe ₂ As ₂
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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. Two single crystals of BaFe ₂ As ₂ were aligned with the same configuration, where magnetic Bragg peak positions, (101) and (103), are measured simultaneously, with and without ultrasound C ₆₆ mode of 18 MHz. The LiNbO ₃ transducers are attached on the (100) plane. Here, ultrasound induced magnetism was studied above the Neel temperature (~137 K). The difference of magnetic Bragg peak intensities (101) and (103) between with and without ultrasound are shown in Figs. 1 and 2 at T=147 K, suggesting possible enhancement of magnetic Bragg peak intensities. Original Bragg peak intensity ratio of (101)/(103) is about one half. Our present result seems to correspond with this ratio. Because of the weak intensity difference, however, we cannot conclude the existence of ultrasound induced magnetism possibly due to the similar enhancement at different Q-points as shown in Fig. 3. We are planning to measure this phenomenon under high proton power condition again.
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2. 実験方法及び結果(つづき) Experimental method and results (continued)

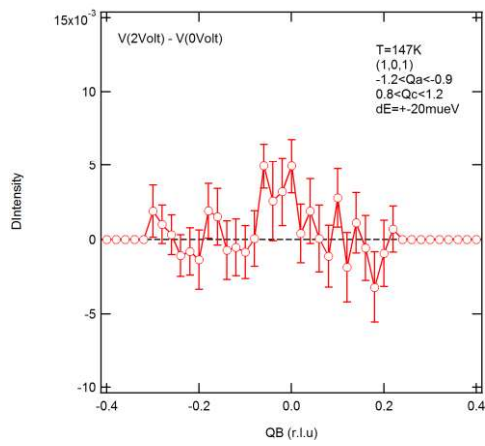


Fig. 1. Enhanced intensity at (101) by ultrasound power at E=2V.

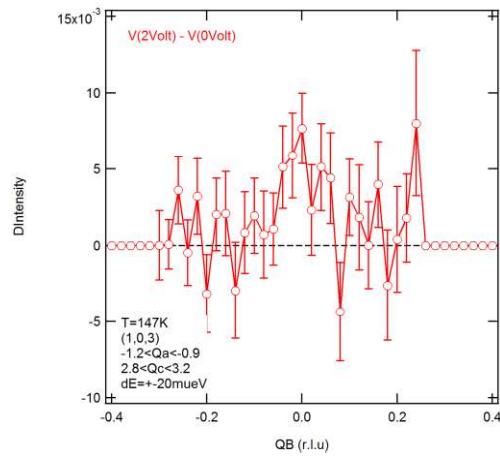


Fig. 2. Enhanced intensity at (103) by ultrasound power at E=2V.

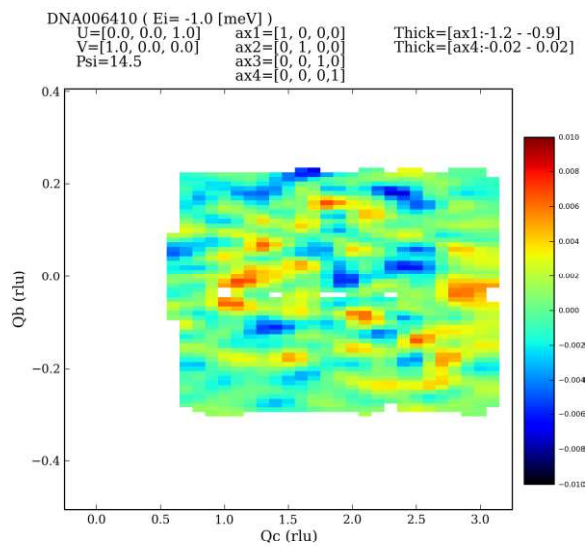


Fig. 3. Intensity difference map between with and without ultrasound at T=147 K.