TOKAI CROSS Experimental Report J-PARC	提出日 Date of Report 2012/3/30
課題番号 Project No. 2011B0013 実験課題名 Title of experiment Search for new spin resonance mode on single crystal $Fe_{1+x}Te_{0.7}Se_{0.3}$ 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 Ryoichi Kajimoto 装置名 Name of Instrument/（BL No.） BL-01 実施日 Date of Experiment 2012/3/13 10:00~ 2012/3/18 10:00

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.

Measured single crystal samples are Fe1.05Te0.7Se0.3 (~14g), Fe1.07Te0.7Se0.3 (~15g), FeTe0.5Se0.5 (~11g).

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 conditions: C-axis of all the crystals is aligned along the beam direction to observe hk0 plane. Experimental conditions are optimized at Ei=45 meV, which are typical and standard ones at BL01. Measured temperatures are 5-6, 20, 100, 200, and 300 K.

Obtained results: Fe1.05Te0.7Se0.3 is partially superconducting with about 10% superconducting shielding volume fraction. It exhibits both Q=(Pi, 0) and (Pi, Pi) spin excitations. The spin resonance has not been observed in this sample. The connection between these two modes in E-Q space is studied but it is not clear at present. Fe1.05Te0.7Se0.3 has about 1% superconducting shielding volume fraction. This sample also shows similar behavior to that of Fe1.05Te0.7Se0.3 sample. As for the last sample, FeTe0.5Se0.5, the spin excitation has been well studied in other groups. We measured on the spectrum change at Q=(2Pi, 0) position above and below superconducting transition temperature, Tc.

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

According to the theoretical calculation by Nagai et al., orbital fluctuation mechanism should show finite change at this Q position, while spin fluctuation mechanism will not exhibit apparent changes. So far, the spectrum at Q=(2Pi, 0) position do not show any apparent change. This is consistent with spin fluctuation mechanism. This detailed analysis is underway.