(※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。)

MLF Experimental Report	提出日 Date of Report 2012/12/12
課題番号 Project No. 2012B0042 実験課題名 Title of experiment Role of interstitial hydrogen in $InGaZnO_x$ probed by muonium hyperfine structure 実験責任者名 Name of principal investigator Ryosuke Kadono 所属 Affiliation KEK-IMSS	装置責任者 Name of responsible person Y. Miyake 装置名 Name of Instrument/(BL No.) D1 実施日 Date of Experiment 2012/12/4 - 2012/12/6

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.

Indium Gallium Zinc Oxide, $InGaZnO_x$,

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.

We performed muon spin rotation measurements under a weak transverse field (TF-μSR) to investigate the occurrence of muonium-like state in a polycrystalline sample of InGaZnO (IGZO). The muonium state is readily detected as a modulation of TF-μSR spectra due to overlapping of signal from muonium with higher rotation frequency or onset of fast depolarization (or loss of initial asymmetry) due to muonium precursor. Unfortunately, we found that the observed spectra only consists of signal from bare muon (μ^+) at the lowest temperature. While this clearly indicates that muonium state is unstable in IGZO, it prevents us from further investigation regarding the muonium state that seems non-existent in the present sample.