



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。)

 Experimental Report 	承認日 Date of Approval 山崎 大 承認者 Approver 2016/6/16 提出日 Date of Report 2016/6/13
課題番号 Project No. 2015A0089 実験課題名 Title of experiment Observation of voltage-induced changes in the magnetic structure around the NiO/Ni interface 実験責任者名 Name of principal investigator Kenta Amemiya 所属 Affiliation High Energy Accelerator Research Organization	装置責任者 Name of Instrument scientist Masayasu Takeda 装置名 Name of Instrument/(BL No.) SHARAKU/BL17 実施日 Date of Experiment 2016/4/16 10:00 – 2016/4/20 10:00 2016/4/20 22:00 – 2016/4/22 10:00

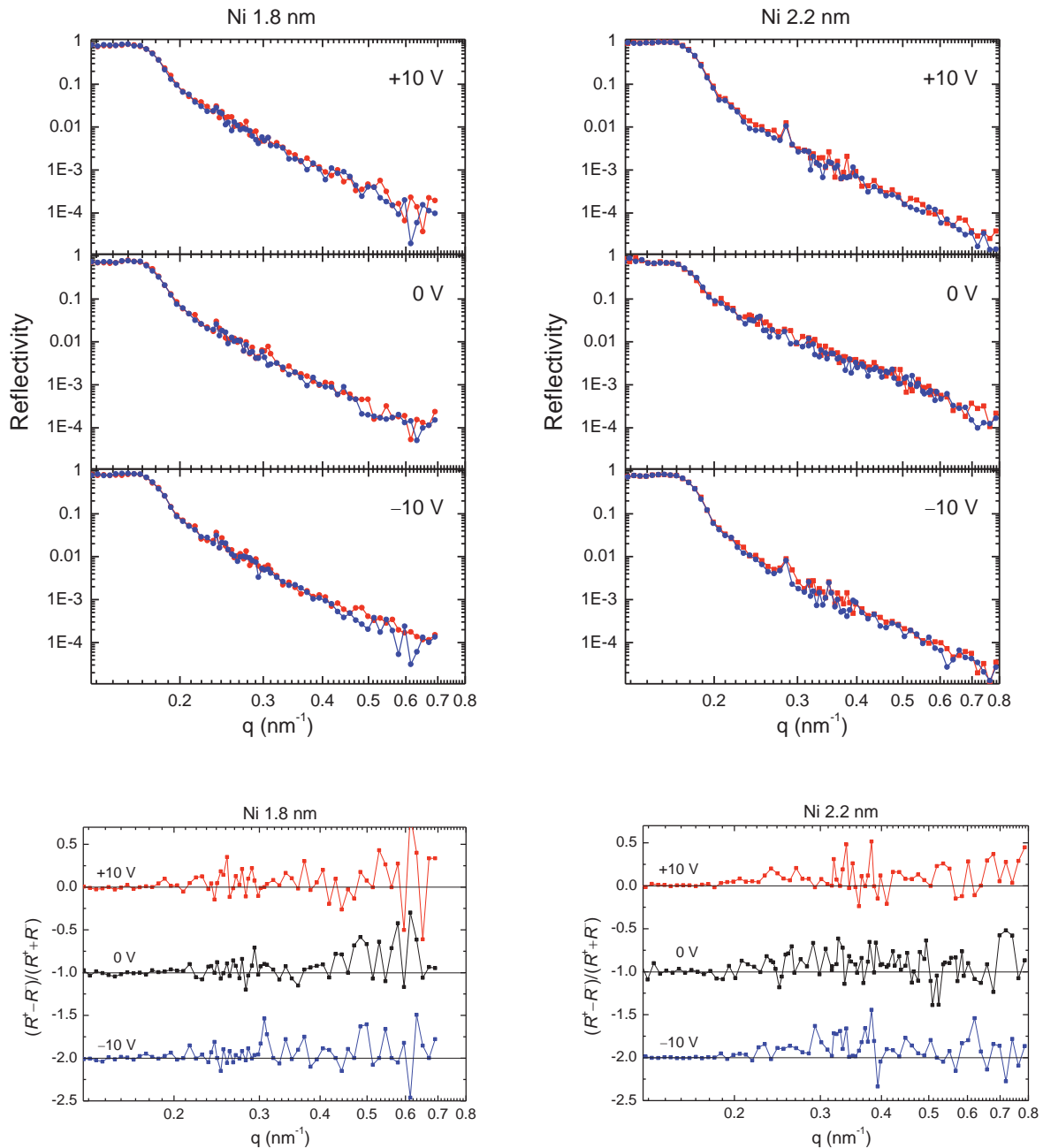
試料、実験方法、利用の結果得られた主なデータ、考察、結論等を、記述して下さい。(適宜、図表添付のこと)
 Please report your samples, experimental method and results, discussion and conclusions. Please add figures and tables for better explanation.

1. 試料 Name of sample(s) and chemical formula, or compositions including physical form.
Au/SiO ₂ /NiO/Ni/Cu(001) thin films

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>The polarized neutron reflectivity (PNR) data were taken at room temperature by adopting the incidence angles of 0.4, 0.9, and 1.2 deg. No spin analyzer was used.</p> <p>The film configurations were chosen to be Cu(Au 8 nm)/NiO(100 nm)/Ni(1.8 and 2.2 nm)/Cu(001). The samples with 1.8 and 2.2 nm Ni have in-plane and perpendicular magnetization, respectively, at the remanence state. A magnetic field of 0.5 T was applied along the film plane in order to make magnetization of the sample lying in plane. Voltages of +10, 0, and -10 V were applied between the top Au layer and the Cu(001) single-crystal substrate during the PNR measurements.</p>

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

Preliminary PNR data for Cu(Au 8 nm)/NiO(100 nm)/Ni(1.8 and 2.2 nm)/Cu(001) are shown below. A difference in reflectivity is recognized between opposite polarizations of the incident neutron beam. The neutron polarization dependence is more prominent for the sample with 2.2 nm Ni, probably due to the difference in the Curie temperatures for the Ni layers.



The detailed analysis of the PNR data is now underway, and by combining with the depth-resolved X-ray magnetic circular dichroism and magneto-optical Kerr effect data, the voltage-dependent magnetic structure of Ni at the interface to antiferromagnetic NiO will be revealed.