

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。)

 MLF Experimental Report	提出日 Date of Report 2014 / 06 / 13
課題番号 Project No. 2013B0177 実験課題名 Title of experiment High resolution quantitative Bragg edge and resonance absorption imaging in applications for engineering, metallurgy, power generation and cultural heritage 実験責任者名 Name of principal investigator Anton TREMSIN 所属 Affiliation University of California at Berkeley, USA	装置責任者 Name of responsible person Kenichi Oikawa 装置名 Name of Instrument/(BL No.) BL 10 実施日 Date of Experiment 2014 / 02 / 26 21:00:00 - 2014 / 03 / 08 07:00:00

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.
<ol style="list-style-type: none"> 1. Laser welds between Al and Fe: ~1 cm x 1 cm x 4 cm 2. Single crystal gold (natural) and polycrystalline gold, 4 samples, ~0.7 x 0.7 x 0.7 cm 3. Multiple materials sample with In, Ta, Cu, Plastic, PCB board, brass, steel – used for resonance absorption imaging. The combination of them fits into ~1.5 cm diameter, ~2 cm tall 4. Quenched steel sample, 1 inch diameter, 1 inch long,, Iron 5. Old steel from ancient object (steel), ~3 cm diameter, ~1 cm thick

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.

The samples were measured as planned with energy resolved transmission imaging, covering the entire spectrum from epithermal energies (~ 30 keV) to cold neutrons (\sim meV), with some gaps for the readout sequence. Simultaneous detection of resonance absorption and Bragg edge (for polycrystalline) and diffraction dips (for single crystal) samples was performed. The integration time was sufficiently long to acquire enough statistics per pixel in order to extract physical information on the samples (both composition from resonance absorption and crystallographic from thermal and cold neutron energy spectra).

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

