


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。 )

 <b>MLF Experimental Report</b>	提出日 Date of Report July 11, 2011
課題番号 Project No. 2009B0033 実験課題名 Title of experiment Line profile study of the evolution of the microstructure of magnesium alloys during deformation 実験責任者名 Name of principal investigator Donald W. Brown 所属 Affiliation Materials Science & Technology Division, Los Alamos National Laboratory, Los Alamos, NM 87545, USA	装置責任者 Name of responsible person Takashi Kamiyama 装置名 Name of Instrument/(BL No.) BL08 実施日 Date of Experiment 2010 October 16 – 2010 October 19

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.
<p>There were 12 bulk, solid, polycrystalline Mg samples, 50 mm long and 6 mm in diameter.</p>

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.
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High resolution diffraction patterns were collected using the back-scattering detectors of the BL08 beamline for all the Mg samples. The Mg samples are made from a rolled plate and deformed in various ways order to induce twinning. The measurements were successful.

In case of each sample two patterns have been collected with perpendicular diffraction vectors, one parallel with the RN rolling normal, the other parallel with the IPT in plane compression direction. These directions were selected in order to be able to collect reflections characteristic to the parent and

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

twin crystals. The evaluation of the measured data is in progress. The data is being evaluated using the Diffraction Line Profile Analysis method, in order to determine the average sub-grain size, the dislocation density and in dislocation arrangement separately in the parent and twin components. It is expected, that the dislocation structure will be different in the parent and twin grains. The aim of the experiment is to explore the nature of this difference. The results of the evaluation will be useful as input data for the polycrystalline modeling methods being developed at LANL.

After finishing the evaluation, the results will be published.