


(※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 16 July 2011
課題番号 Project No. 2010B0008 実験課題名 Title of experiment In-situ neutron diffraction study of the deformation mechanism in Cobalt 実験責任者名 Name of principal investigator Vladimir Luzin 所属 Affiliation Australian Nuclear Science & Technology Organisation	装置責任者 Name of responsible person Stefanus Harjo 装置名 Name of Instrument/(BL No.) TACUMI/BL19 実施日 Date of Experiment 9-11 March 2011

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.
Cobalt in metal polycrystalline solid form

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.
Accordingly to the experiment plan two in-situ loading experiments were performed on cobalt samples: one in compression, one in tension. During loading of each sample the full diffraction patterns was acquired for different plastic deformations. Patterns were recorded in the two bank of the detectors that give information for two principal direction in the sample - parallel and perpendicular to the load direction. Single peak fitting has been used to get lattice plane strain for individual (hkl) reflections. The results are shown in Figures 1 and 2 for the tension and compression experiment correspondingly. These results (together with subsequent texture measurements) are to be matched with the EPSC modeling that will help to better understanding of deformation mechanisms of cobalt and hexagonal materials in general.

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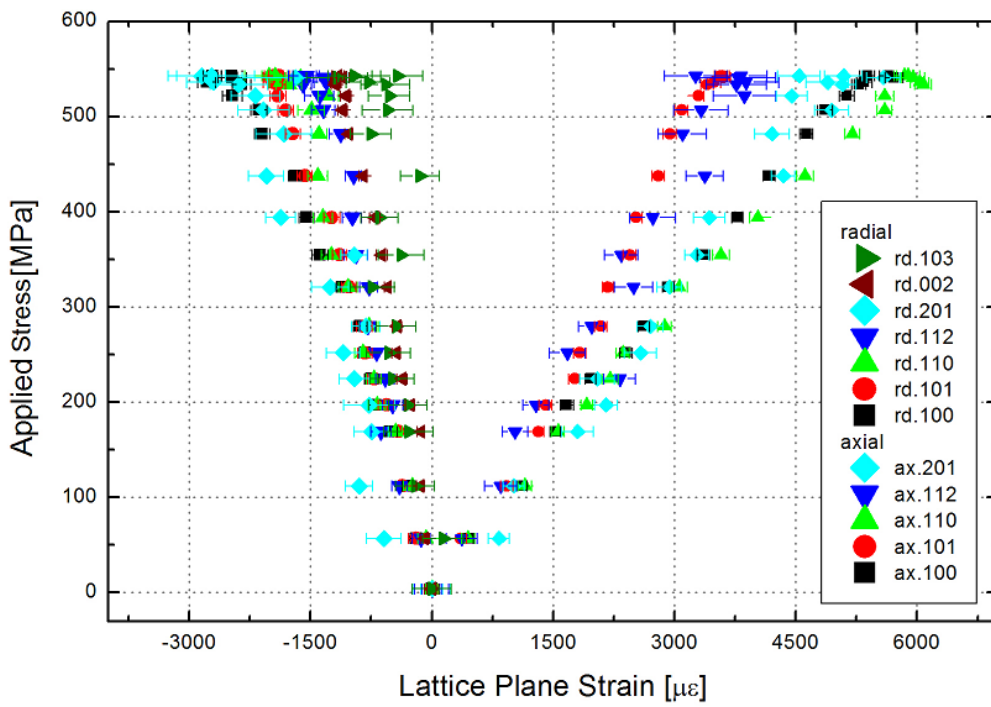


Fig. 1. Tension experiment: evolution of the elastic lattice plane strains for different (hkl) reflections as experimentally measured in parallel (axial) and perpendicular (radial) directions to the direction of loading and plotted a function applied stress.

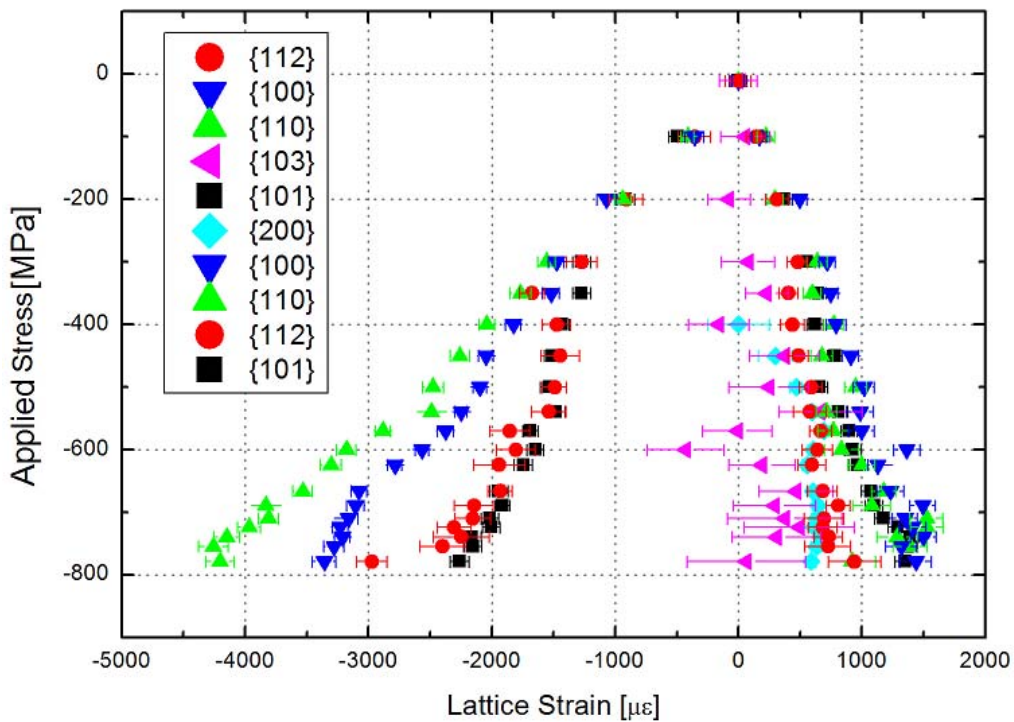


Fig. 2. Compression experiment: evolution of the elastic lattice plane strains for different (hkl) reflections as experimentally measured in parallel (axial) and perpendicular (radial) directions to the direction of loading and plotted a function applied stress.