MLF Experimental Report	提出日 Date of report 27/May/2014
実験課題番号 Project No. 2013P0602 実験課題名 Title of experiment Development of fundamental techniques for pulsed neutron imaging 実験責任者名 Name of principal investigator Yoshiaki Kiyanagi 所属 Affiliation Nagoya University	装置責任者 Name of responsible person K. Aizawa 装置名 Name of Instrument/（BL No.） BL19 利用期間 Dates of experiments 15/May/2013 – 17/May/2013

1．研究成果概要（試料の名称、組成、物理的・化学的性状を明記するとともに、実験方法、利用の結果得られた主なデータ、考察、結論、図表等を記述してください。

Outline of experimental results (experimental method and results should be reported including sample information such as composition, physical and/or chemical characteristics.

We tried in-situ measurement of Al (pure) and Al-Ni alloy ($Al_{0.98}Ni_{0.02}$) by Bragg-edge transmission combined with diffraction during tensile test. These alloys were worked plastically by ECAP (eqal-channel-angular-pressing). In order to estimate the lattice strain and texture change, neutron diffraction and transmission experiments were carried out by using BL19. It is important to detect the position dependence of strain and the accurate residual strain in the material and texture by in-situ measurement.

Fig. 1 shows the diffraction profiles of North bank data. Fig. 2 shows the change of lattice strain by diffraction. The lattice strain of 111 and 200 reflections of North bank were increasing with increasing applied stress, but that of South bank decreased.

1. 研究成果概要（つづき） Outline of experimental results (continued).

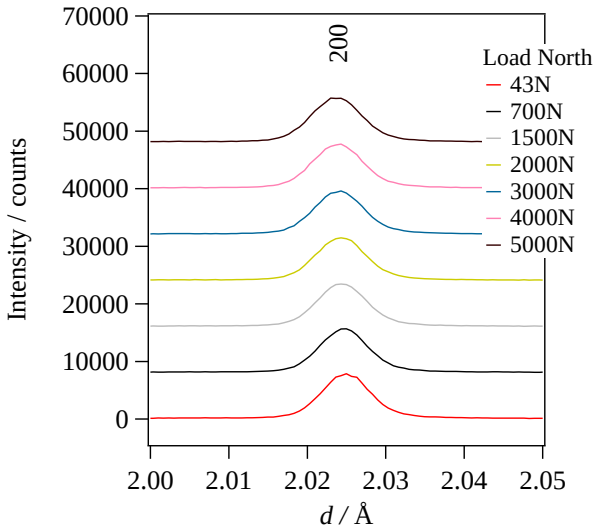

Fig. 1 Diffraction profiles.

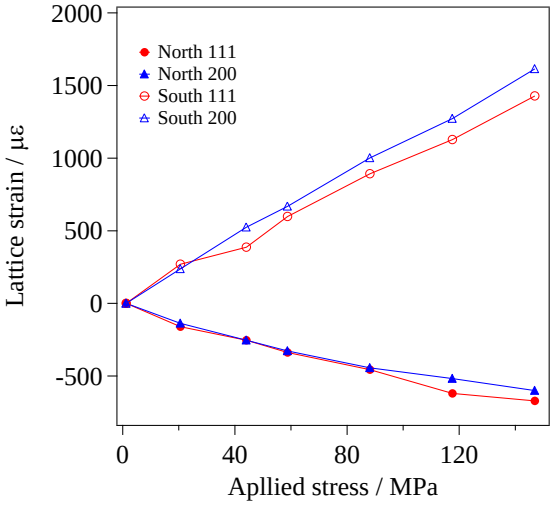

Fig. 2 Lattice strain of North and South banks.

Fig. 3 shows the incident transmittance spectrum BL19. The Bragg-edges of Al windows in the beam duct were clearly observed in the spectrum. We could not confirm the count loss of the incident transmittance spectrum. The accurate transmittance was measured by this system. Fig. 4 shows the transmission of 111 and 200 Bragg-edges of Al-Ni alloy during the tensile test. The position dependence of the transmission spectrum was observed. The sample texture after ECAP process is inhomogeneous. The difference of transmission spectrum depends on the texture in the sample. Texture analysis is under way by RITS code.

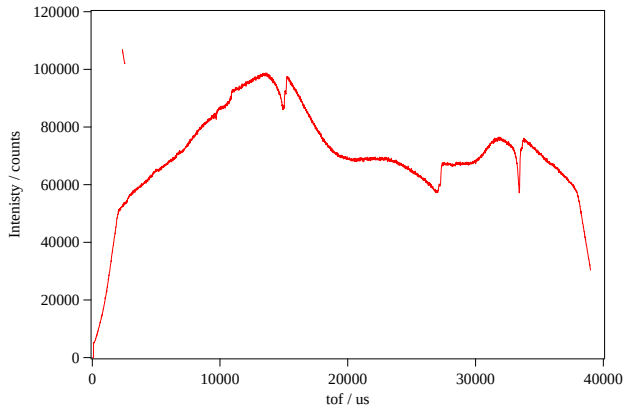

Fig. 3 Incident spetrun of BL19.

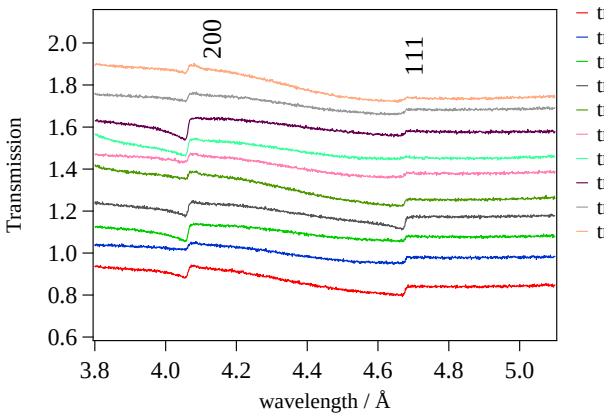

Fig. 4 Bragg-edge profiles of Al-Ni during tensile test.

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