MLF Experimental Report	提出日 Date of Report 2010.5.24
課題番号 Project No. 2008A0071 実験課題名 Title of experiment Commissioning and preliminary experiments of SuperHRPD 実験責任者名 Name of principal investigator T. Kamiyama 所属 Affiliation	装置責任者 Name of responsible person T. Kamiyama 装置名 Name of Instrument/（BL No.） BL08 実施日 Date of Experiment

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.

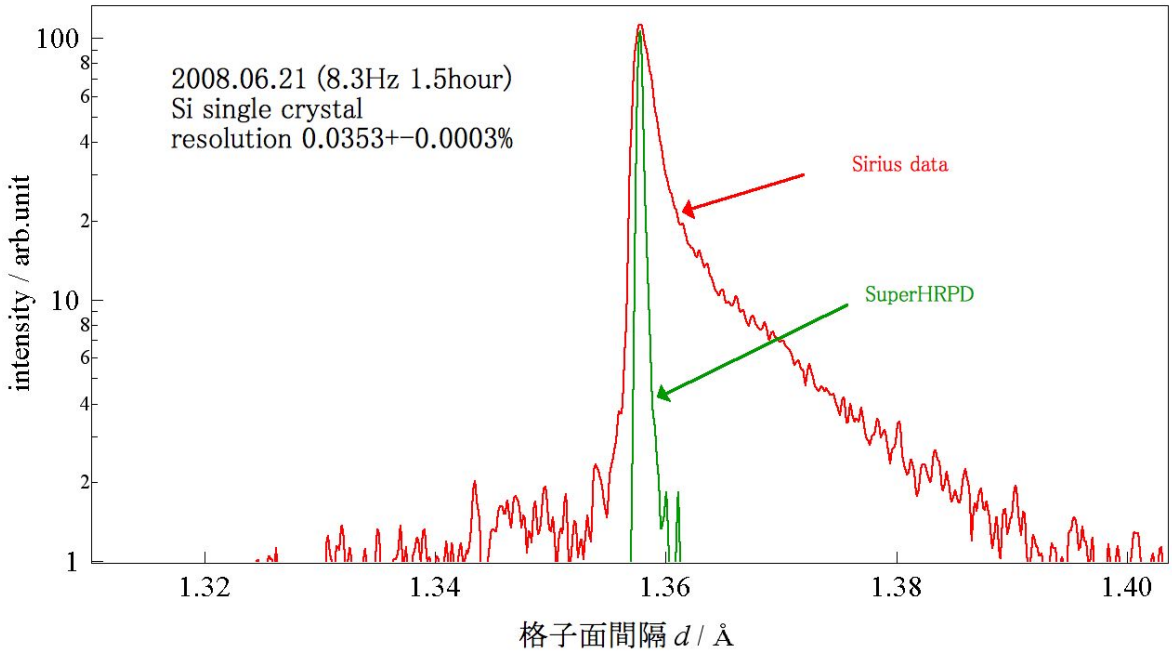
1. 試料 Name of sample(s) and chemical formula, or compositions including physical form.

NIST Si, Ce, and other standard samples

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.

Commissioning was done with using the existing Sirius chamber which had been used at KENS facility (Phase I). Simultaneously, we carried out basic study to design and construct a new SuperHRPD chamber which replaced the Sirius chamber in Summer of 2009 (Phase II).
We have succeeded in achieving the best resolution among all the neutron powder diffractometers in the world. After repeated trials in rewriting the “world record”, SuperHRPD had achieved $\Delta d/d = 0.035$ % in June 21. More significantly, the tail observed in each Bragg peak in the KENS Sirius diffractometer was not observed resulting in 10 times improvement in 1/10-width.
Although we have achieved 0.035 % resolution with only a part of detector pixels, time-focusing was incompletely done for 1/10 of total number of detectors. Structure analysis is not possible until reliable λ(lambda) is obtained. In addition, although we have taken measures against earthquake and ground settlement by adopting special beamline-support structures as well as setting accelerometers and settlement sensors, we should keep watching the change of the

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



The measured Bragg reflection at d = 1.36 Å. In comparison, the same Bragg reflection obtained by the previous high resolution powder diffractometer *Sirius* (KEK – KENS) is shown.