


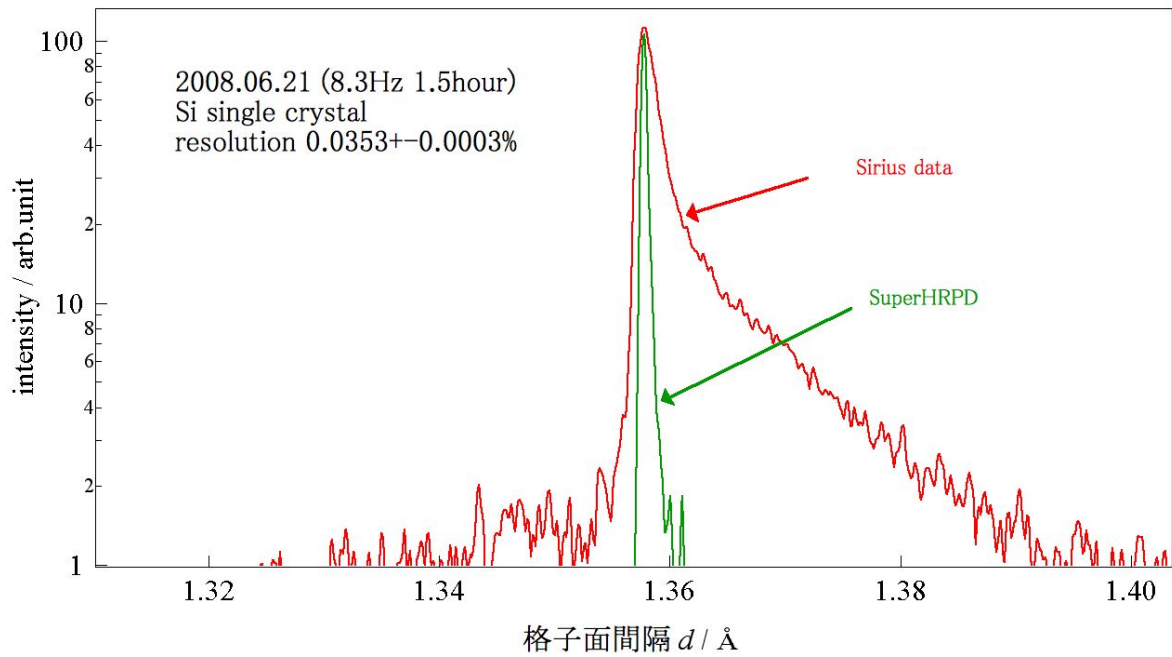
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|  <b>MLF Experimental Report</b>  | 提出日 Date of Report<br>2010.5.24  |
| 課題番号 Project No. 2008A0071<br><br>実験課題名 Title of experiment<br>Commissioning and preliminary experiments of SuperHRPD<br>実験責任者名 Name of principal investigator<br>T. Kamiyama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

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| 1. 試料 Name of sample(s) and chemical formula, or compositions including physical form.<br><br>NIST Si, Ce, and other standard samples |
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| 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。)<br>Experimental method and results. If you failed to conduct experiment as planned, please describe reasons.<br><br>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).<br>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.<br>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 $\lambda$ (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 beamline and neutron beam spectra. |
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## 2. 実験方法及び結果(つづき) Experimental method and results (continued)



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