Flight Path 3

HIPD Fact Sheet

High-Intensity Powder Diffractometer

The High Intensity Powder Diffractometer (HIPD) is a high intensity medium resolution powder diffractometer designed for studies of crystal and magnetic structures as well as local structure analysis by pair distribution function (PDF) analysis. High counting rates are achieved thanks to the proximity to the neutron source (primary flight path = 9m). The beam size at the sample position is 1 cm wide and 5 cm high and collimation can be added to support small sample volumes and specialized ancillary equipment. Eight detector banks are located at ± 153°, ± 90°, ± 40°, ± 14°, each covering ± 5° which allows for a coverage of a very wide Q range. HIPD is ideally suited for studying magnetic structures, phase transitions, local structure, small samples, neutron absorbing materials, and amorphous liquids and solids, time resolved measurements, and high pressure studies.

FOR MORE INFORMATION, CONTACT:

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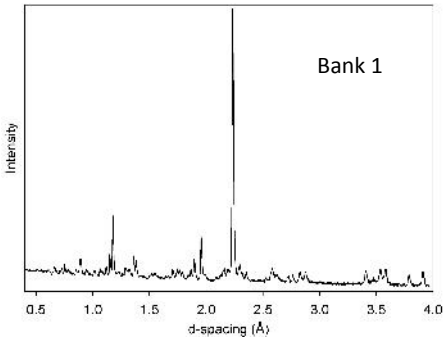
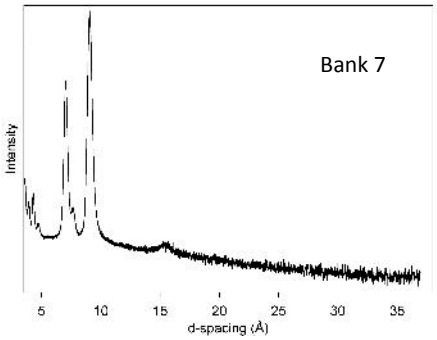
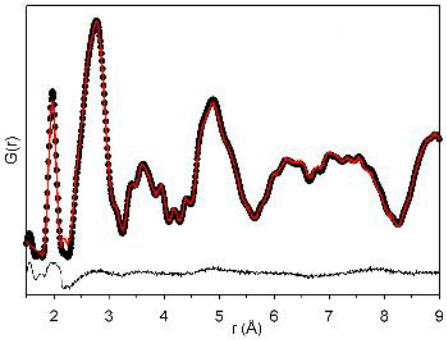
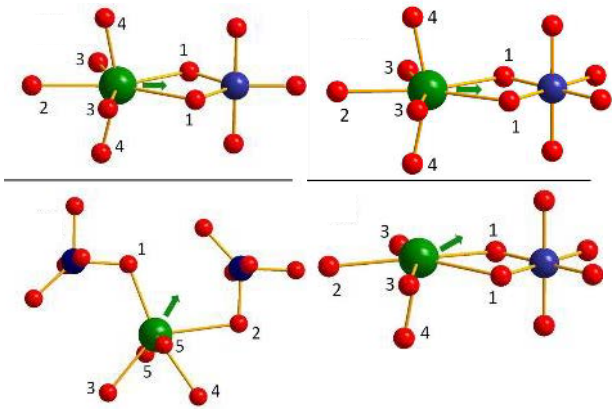




Data from bank 1 (left) showing the high resolution at low d-spacing of the backscattering bank (153°), and bank 7 (14°, right) showing coverage up to very high d-spacing.





The PDF of $Sr_3SbO_{5.5}$ and the fit obtained by Reverse Monte Carlo (RMC) modeling (top). The local distortion away from the ideal perovskite structure as determined from the PDF analysis (bottom). [G. King, K. J. Thomas, A. Llobet, *Inorg. Chem.* 51 (2012).]

Specifications	
Wavelength Range	0.20 – 10.0 Å
Beam width	0.3 – 1.0 cm, variable
Beam height	0.3 – 5.0 cm, variable
Q range	0.2 – 60 $Å^{-1}$
d-spacing range (approx) and resolution	± 14° / 3.54 – 38.0 Å / 3% ± 40° / 1.13 – 22.28 Å / 1% ± 90° / 0.56 – 5.57 Å / 0.5% ± 153° / 0.40 – 4.0 Å / 0.3%
Moderator	Water at 283 K
Sample environments	4 -750 K, closed cycle refrigerator with He exchange gas, heating stick, high pressure cell
Sample size	0.05 – 4 cm^3
Experiment Duration	Less than 5 minutes to 1 day