MLF Experimental Report

提出日 Date of Report

課題番号 Project No. 2017A0072	装置責任者 Name of responsible person Toshiya Otomo
実験課題名 Title of experiment Local Structure and Magnetic Properties of Layered pnictides	装置名 Name of Instrument/（BL No.） BL 21
実験責任者名 Name of principal investigator Takafumi Yamamoto	実施日 Date of Experiment 2017/4/8-9, 6/9-10
所属 Affiliation Kyoto University	

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.

M_2ZnSb_3, (M = Zr, Hf)

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.

   We obtained a pair distribution function (PDF) of M_2ZnSb_3 (M = Zr, Hf) by a Fourier transform of neutron total scattering data collected at NOVA. The following figure represents the PDF patterns of M_2ZnSb_3 as a function of distance, r. Due to the close value of neutron cross section between Zr (7.16) and Hf (7.7), the two PDF curves have essentially similar characteristics, apart from slight difference of each lattice parameter. However, a significant deviation is found around $r \sim 8.6$ Å, which is almost equivalent to the interlayer distance in $M_2Zn_2Sb_3$. This implies that the stacking patterns of ZnSb layer is distinct from each other. We need further analysis of the PDF data to determine the real local structure of these two compounds.
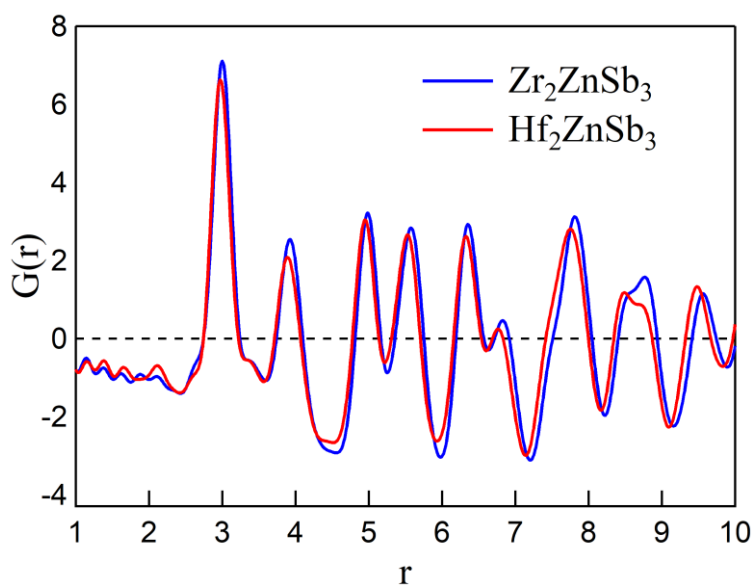
Figure. Neutron PDF, G(r), as a function of distance, r, collected at NOVA