

## Poster Presentation

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### *Development of SuperHRPD, a TOF neutron powder diffractometer at J-PARC*

T. Kamiyama<sup>1</sup>, T. Shuki<sup>1</sup>, S. Lee<sup>1</sup>, P. Miao<sup>1</sup>, M. Yonemura<sup>1</sup>, Y. Ishikawa<sup>1</sup>, Y. Noda<sup>1</sup>, R. Tomiyasu<sup>1</sup>

<sup>1</sup>*High Energy Accelerator Research Organization, Tokai, Japan*

SuperHRPD is one of six time-of-flight neutron powder diffractometers in the Materials and Life Science Experimental Facility (MLF) of the Japan Proton Accelerator Research Complex (J-PARC). SuperHRPD is looking at a newly developed high resolution moderator which gives narrow & symmetrical neutron pulse with less tails. With using this moderator and lower repetition rate of 25Hz as well as the flight path shorter than 100 m, a high resolution and wide dynamical range is attainable with limited loss of neutrons. The designed highest resolution of SuperHRPD is as high as  $\Delta d/d = 0.035\%$  in the backward bank. Although unplanned shutdown for two years due to the earthquake and the Hadron radiation accident, SuperHRPD has been upgraded repeatedly by the scattering chamber replacement, the increase of detector solid angle, and the improvement of the detector systems, and improvement of resolution. Sample environments cover 4 K – 1000 K, 10GPa and 14 T with up to  $d = 40 \text{ \AA}$ . It is emphasized the magnet was designed to detect tiny structural changes precisely as well as magnetic reflections up to 14 T. After three years of operation, we confirmed higher resolution can reduce systematic errors in structural analyses. The current status of SuperHRPD will be reported.

**Keywords:** Neutron, High Resolution Powder diffraction