

BL05 中性子ビーム偏極率の精密測定 Measurement of neutron beam polarization for the BL05/NOP beamline at MLF/J-PARC

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We measured the neutron beam polarization for the polarized beam branch of the BL05/NOP beamline using the polarized ^3He gas as a neutron spin analyzer with a precision of less than 10^{-3} .

The BL05/NOP (Neutron Optics and Physics) beamline is dedicated for fundamental physics experiments with slow neutrons at Materials and Life science experimental Facility (MLF) in J-PARC. Utilizing beam splitting super-mirror benders, the BL05/NOP beamline provides three unique neutron beam branches. They are the low divergence beam for interferometry experiments, the polarized beam for the neutron beta decay and other measurements, and the unpolarized beam for common use. The most important feature of the BL05/NOP beamline is the low background environment since the high-energy direct beam is absorbed in the direct beam dump, which is placed just downstream the beam splitting benders, and only low-energy neutrons are delivered to the experimental area of the three branches. Details of the measurement and consideration of the uncertainties are presented.