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Longitudinal and Transverse Components in the X-ray Resonant Magnetic Reflectivity Experiment J.-S. LEE, E. VESCOVO, C.-C. KAO, NSLS, J.-M. BEAUJOUR, A.D. KENT, NYU, H. JANG, J.-Y. KIM, J.-H. PARK, POSTECH, PLS COLLABORATION — X-ray Resonant Magnetic Reflectivity (XRMR) is a powerful tool: It allows to simultaneously probe the structural and the magnetic properties of complex multilayer structures. It is often advantageous to utilize circular polarized synchrotron radiation to obtain magnetic information. Unfortunately, in XRMR measurement using circular polarization, the transverse and longitudinal components are intrinsically mixed, making a proper vector-analysis of the magnetization usually impossible. In this work, we strive to overcome this restriction. In particular we demonstrate how to effectively separate the transverse and longitudinal components in the scattering experiment using circular polarized light. This is accomplished by taking advantage of x-ray interference effects which fully suppress the longitudinal component at all angles where the magnetic asymmetry ratio is null. At these angles only the purely transverse component is therefore left in the data.

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