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Adding depth sensitivity to photoelectron microscopy using the standing wave/wedge method FLORIAN KRONAST, BESSY GmbH, Berlin, ALEXANDER KEISER, CARSTEN WIEMANN, IFF9, Juelich Research Center , RUSLAN OVSYANNIKOV, BESSY GmbH, Berlin, ANDREA LOCATELLI, Elettra, Trieste, DANIEL BUERGLER, REINERT SCHREIBER, IFF-9, Juelich Research Center, SEE-HUN YANG, IBM Almaden Research Ctr., HERMANN DUERR, BESSY GmbH, Berlin, CLAUS SCHNEIDER, IFF9, Juelich Research Center, CHARLES FADLEY, UC Davis and LBNL Mat. Sci. Div. — Photoelectron microscopy (PEEM) is by now a well-established technique for studying many types of multilayer or multicomponent structure, including samples of relevance to spintronics, semiconductor technology, and polymer-based materials. The lateral resolution in such microscopes is typically 20 nm, but with the prospect of going down to ca. 1 nm in the near future. However, resolution perpendicular to the surface is not inherent in PEEM measurements, and we here discuss a novel method for providing this at sub-nm resolution, by exciting the photoelectrons with a standing wave created by soft x-ray reflection from a multilayer substrate, and growing one layer of the sample in a wedge form. This standing wave/wedge method has been demonstrated for the first time in measurements with a PEEM located at BESSY in Berlin.

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