Element-Specific Magneto-Optical Studies Using Tunable X-Ray Multilayer Polarizers

J.B. Kortright and M. Rice
Center for X-Ray Optics and Advanced Light Source
Lawrence Berkeley National Laboratory
Berkeley, California 94720 USA

Multilayer linear polarizers extend magneto-optical rotation techniques from the visible into the 50 - 900 eV range. Continuously tunable polarizers allow spectroscopic measurements across atomic core levels, making the techniques element- specific. At core levels the resonant magneto-optical signals can be orders of magnitude larger than comparable signals in the visible range. These new capabilities have been used to measure the magnetization response (hysteresis loops) of individual elements in Fe-Cr multilayers and alloys. Instrumentation, techniques, and early results will be discussed.