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X-ray resonant magnetic scattering ellipsometer

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It is very difficult to characterize the polarization of a synchrotron radiation source in the soft and/or intermediate x-ray energy region particularly from 1 to 2 keV. The conventional multilayer mirror or single-crystal polarimeters do not work over this energy region because their throughput (the reflectivities combined with the phase shift) becomes insignificant. In this paper, we present a new ellipsometer scheme that is able to fully characterize the polarization of synchrotron radiation sources in this energy region. It is based on the dichroic x-ray resonant ferromagnetic scattering that yields information on both the polarization of the x-ray and the material (element specific) dielectric-constant tensor [1] due to the interband ferromagnetic Kerr effect [2].

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