(초청강연)

Soft x-ray magneto-optical effect as a nanometer scale probe of heteromagnetic structures widely used in spintronics devices

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Heteromagnetic nanostructures, which consist of two or more different layers such as nonmagnet, insulator, ferromagnet, antiferromagnet, and superconductor, have been widely used in current and likely future spintronics devices. Their many intriguing magnetic properties are originated from a variety of magnetic interactions at relevant length scales at or near interfaces and between different constituent layers as well as laterally different regions in chemical and magnetic heterogeneity. The fundamental properties can thus differ along depth and laterally in the film plane, depending on their relevant coupling length scales. The entire properties may be characterized by interface properties and/or the depth-varying properties of the individual constituent layers, and lateral inhomogeneity as well. It is a challenge to investigate both depth-varying properties and lateral heterogeneity in such heteromagnetic nanostructures.

In this talk, soft x-ray magneto-optical effect as a nanometer scale probe of a variety of heteromagnetic structures is presented and its related noble techniques are introduced. For instances, magnetization vector imaging to investigate vector spin configurations in the film plane is presented, as well as the Kerr rotation, ellipticity, and intensity measurements as a depth sensitive probe on the atomic scales.