

54. Title: Spin Resonance in EuTiO₃ Probed by Time-Domain Gigahertz Ellipsometry

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Abstract: We show an example of a purely magnetic spin resonance in EuTiO₃ and the resulting new record high Faraday rotation of 590 degrees /mm at 1.6 T for 1 cm wavelengths probed by a novel technique of magneto-optical gigahertz time-domain ellipsometry. From our transmission measurements of linear polarized light, we map out the complex index of refraction $n = \sqrt{\epsilon \mu}$ in the gigahertz to terahertz range. We observe a strong resonant absorption by magnetic dipole transitions involving the Zeeman split $S = 7/2$ magnetic energy levels of the Eu²⁺ ions, which causes a very large dichroism for circular polarized radiation.