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Magnetochiral dichroism resonant with electromagnons in a chiral-lattice magnet Cu_2OSeO_3 YOSHIHIRO OKAMURA, Univ. of Tokyo, FUMITAKA KAGAWA, SHINICHIRO SEKI, MASASHI KUBOTA, MASASHI KAWASAKI, RIKEN Center for Emergent Matter Science (CEMS), YOSHINORI TOKURA, Univ. of Tokyo, UNIV. OF TOKYO TEAM, RIKEN CENTER FOR EMERGENT MATTER SCIENCE (CEMS) COLLABORATION, POWER ELECTRONICS R&D UNIT, ROHM CO., LTD. COLLABORATION — Multiferroics, in which magnetic and ferroelectric properties coexist and are entangled, is one of the most promising candidates for materials that are capable of the control of the magnetization (M) by an electric field and the electric polarization (P) by a magnetic field. One direct consequence of the strong magnetoelectric (ME) coupling in multiferroics is an intriguing spin excitation endowed with electric-dipole activity. This remarkable spin excitation, termed as electromagnon, is ubiquitously found in multiferroics. In this study, we performed broadband microwave spectroscopy under magnetic fields in Faraday geometry to study the ME resonant character of the electromagnon in a multiferroic chiral-lattice magnet Cu_2OSeO_3. We successfully observed different transmittance for oppositely propagating microwaves upon the electromagnon–the behavior known as magnetochiral dichroism (MChD). By studying the MChD spectra for various configurations, we elucidate the relationship between the MChD spectra and the dynamics of M and P upon the electromagnon excitation. We also discuss the magnitude of the MChD within the framework of a quantum theory and find that the theory well reproduces the experiment.

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