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Magneto-Optical Devices and Spin-Wave Devices Using Magnetic Garnets

Summary

Magneto-optical devices controlling light through magnetism fascinate researchers with their unique characteristics impossible to replicate elsewhere, also drawing significant attention from industry. The starring material in this field is magnetic garnet, a magnetic oxide crystal. I will introduce optical device development using this material, including thin-film Q-switch lasers for mechanical processing, magnetic hologram lenses for pest control, and optical isolators for data centers. My presentation covers material development involving ion beam sputtering, laser heat treatment, epitaxial growth, NanoTerasu synchrotron radiation, and Fugaku supercomputer. Furthermore, I will present spin wave logic devices, magnonic crystals, and magnetic sensors made from these same magnetic garnet materials.

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