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**Magnetolectrical control of nonreciprocal microwave response in a multiferroic helimagnet** YUSUKE IGUCHI, YOICHI NII, YOSHINORI ONOSE, Department of Basic Science, University of Tokyo — Control of physical property in terms of external fields is essential for contemporary technologies. The conductance can be controlled by a gate electric field in a field effect transistor, which is a main component of the integrated circuit. Optical phenomena induced by an electric field such as electroluminescence and electrochromism are useful for display and other technologies. Control of microwave propagation seems also imperative for future wireless communication technology. Microwave properties in solids are dominated mostly by magnetic excitations, which cannot be easily controlled by an electric field. One of the solutions for this problem is utilizing magnetically induced ferroelectrics (multiferroics). Here we show that microwave nonreciprocity, which is difference between oppositely propagating microwaves, can be reversed by the external electric field in a multiferroic helimagnet  $\text{Ba}_2\text{Mg}_2\text{Fe}_{12}\text{O}_{22}$ . This result offers a new avenue for the electrical control of microwave properties.

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