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Ultrafast dynamics in multiferroic BiFeO₃ YU-MIIN SHEU, ROHIT PRASANKUMAR, ANTOINETTE TAYLOR, Los Alamos National Laboratory — We report the ultrafast time-resolved optical measurements of multiferroic BiFeO₃, which exhibits both magnetic and ferroelectric ordering at room temperature. The coupling between these two orders makes it an attractive material for potential data-storage devices. However, a detailed understanding of this coupling is still under debate. Ultrafast optical spectroscopy can potentially shed light on magnetoelectric coupling in BiFeO₃ by unraveling the different contributions in the time domain. Here, we use degenerate 400 nm pump-probe spectroscopy to excite and probe a BiFeO₃ thin film above its bandgap. The measured relaxation consists of a fast decay (~ 1 ps) followed by a slow recovery (~ 150 ps). We attribute the fast component to the recovery of photoexcited carriers. The slow recovery may be due to spin-lattice relaxation.

Yu-Miin Sheu
Los Alamos National Laboratory

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