Abstract Submitted for the MAR16 Meeting of The American Physical Society

Exciton spin dynamics in MAPbI₃ measured by Hanle effect¹ WILLIAM TALMADGE, University of Utah Department of Physics and Astronomy, RUIZHI WANG, University of Utah Department of Physics and Astronomy, Nanjing University of Science and Technology, PATRICK ODENTHAL, NATHAN GUNDLACH, CHUANG ZHANG, DALI SUN, ZEEV VALY VARDENY, YAN (SARAH) LI, University of Utah Department of Physics and Astronomy — The organic-inorganic hybrid perovskites have emerged as a highly promising class of semiconductors for photovoltaic applications. The properties responsible for the high photoconversion efficiency are under extensive investigation. There have; however, been fewer investigations of spin-dependent effects in this class of materials. We present energy dependent photoinduced Faraday rotation in polycrystalline thin film CH₃NH₃PbI₃, which benefit from the band structure and optical selection rules. The Faraday rotation spectrum follows the exciton absorption band at low temperatures, indicating its excitonic origin. Through the Hanle effect, based on Faraday rotation, we found the coexistence of two spin components at 4 K, which was confirmed through time resolved measurements. Research supported by the NSF-MRSEC (DMR 1121252) at the University of Utah.

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