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Carrier Spin Relaxation in 2D Ruddlesden-Popper Perovskite Semiconductors (G)

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Research into organo-halide perovskites has flourished due to their unprecedented success as an absorbing layer in solution processed solar cells. Theoretical studies have shown these materials exhibit intriguing optical properties such as large spin-orbit coupling, photo-induced magnetization, and spin-dependent optical Stark effect, leading to potential spintronic applications. However; very few spin-related experimental studies have been reported. Here we report circular-polarized pump-probe studies of the 2D perovskite butylammonium methylammonium lead iodide. These results indicate a strong influence of Rashba spin-splitting on the carrier kinetics, consistent with our recent four-wave mixing studies of bulk $\text{CH}_3\text{NH}_3\text{PbI}_3$.

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