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All Optical Helicity Dependent Spin Switching ZACHARY BABYAK, TANNER LATTA, MITSUKO KOROBKIN, GUO-PING ZHANG, Indiana State Univ — It is known that the spin of an electron can be manipulated via an interaction with an external magnetic field. The phenomenon of all optical helicity dependent spin switching, or all optical switching (AOS), is novel method of spin manipulation which can invert a given spin via an interaction with an electric field in the form of ultrafast laser pulses on femtosecond timescales. In the following study, we demonstrate AOS is possible through our theory, by applying left and right circularly polarized light to a small electron spin system. We further demonstrate that AOS can be achieved through our theory using a small number of multiple laser pulses, suggesting it may align with experiment where the number of pulses is on the order of 10^3.

Zachary Babyak
Indiana State Univ

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