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Electric field induced spin dynamics and polaritons in Weyl semimetal JIMMY HUTASOIT, CHAO-XING LIU, The Pennsylvania State University — In Weyl semimetal, magnetization acts like a "chiral magnetic" field that, unlike the conventional magnetic field, couples differently to the left-handed and right-handed Weyl fermions. Integrating out the Weyl fermions, we find a non-local effective theory that describes the interaction between the magnetization and the electromagnetic field. In particular, we find that the system exhibits non-trivial spin dynamics controllable by the external electric field. Furthermore, the coupling between the magnetization and electromagnetic waves give rise to polaritons.

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