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Low energy electrodynamics of triangular lattice quantum spin liquid candidate $YbMgGaO_4$ XINSHU ZHANG, FAHAD MAHMOOD, NICHOLAS LAURITA, Johns Hopkins University, ZHILING DUN, HAIDONG ZHOU, University of Tennessee, MARTIN MOURIGAL, Georgia Institute of Technology, PETER ARMITAGE, Johns Hopkins University — Quantum spin liquids (QSL) are exotic magnetic states where spins do not order down to the lowest temperatures. Spin 1/2 two-dimensional triangular antiferromagnet $YbMgGaO_4$ is a promising QSL candidate. Here we report an optical measurement on $YbMgGaO_4$ using time domain terahertz spectroscopy (TDTS)and Fourier transform spectroscopy (FTIR). We find the real part of in-plane dissipative response shows a power law behavior that may arise from spin liquid properties. Applying magnetic field in the Faraday geometry, we approach the spin polarized state from which we can extract g-factors and determine exchange constants quantitatively. We also identify a crystal field excitation in the infrared measurement. Our results provide guidance for the future theoretical study of this QSL.

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