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Optical Conductivity of Valence Bond Solid Phases on the Kagome Lattice KYUSUNG HWANG, SUBHRO BATTACHARJEE, YONG BAEK KIM, Univ of Toronto — We propose that optical responses below the Mott gap can be used to obtain useful information about excitation spectra in valence bond solid phases in Mott insulators. The optical conductivity in this regime arises due to the electronic polarization mechanism via virtual electron hopping processes. We apply this mechanism to the Hubbard model with spin-orbit coupling and/or the corresponding spin model with significant Dzyaloshinskii-Moriya interaction, and compute the optical conductivity. Our results are discussed in light of the existing and future experiments on the deformed Kagome lattice material, Rb2Cu3SnF12 with the pinwheel valence bond solid state, and other valence bond solid phases proposed for the ideal Kagome lattice.

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