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Quantum electric dipoles in spin liquid dimer Mott insulator

CHISA HOTTA, Kyoto Sangyo University — We present an effective dipolar-spin model based on the strong coupling analysis, which may explain the possible origin of the “spin liquid Mott insulator” of the organic triangular lattice system, $\kappa\text{-ET}_2\text{Cu}_2(\text{CN})_3$, whose gapless spin liquid state had been discussed in the context of geometrical frustration of exchange coupling, J , between spins on dimer orbitals. We find out that another degrees of freedom within the insulator, quantum electric-dipoles on dimers, interacts with each other by the Coulomb interaction and brings about a significant suppression of J through the dipolar-spin coupling.

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