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Magnetic and Chiral Excitations in Resonant Raman Scattering THOMAS DEVEREAUX, CHUNJING JIA, YAO WANG, BRIAN MORITZ, SLAC & Stanford, RUDI HACKL, Walther Meissner Institute — For the strongly correlated materials such as the cuprate parent compounds, the two-magnon excitations can be measured by the Raman scattering imposing the B_{1g} symmetry, while chiral excitations can be probed using circularly polarized light. We study the resonance enhancement of these excitations and their relationship to the optical conductivity based on cluster exact diagonalization studies of the single-band as well as multi-orbital Hubbard models. Our theoretical studies help understand Raman experiments for the half-filled cuprates as well as the lightly doped (electron and hole doped) cuprates, and the relationships to other experiments on the same materials.

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