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Strong coupling optical spectra in dipole-dipole interacting Tavis-Cummings models IMRAN MIRZA, University of Michigan, Ann Arbor, USA — Hybrid quantum systems offer novel and unique platforms for quantum technologies [G. Kurizki et.al, PNAS, 112 (13), 3866-3873 (2015)]. Hybrid atom-optomechanics (HAOM) is fascinating example in this context. In these Hybrid systems, a wealth of phenomena can arise due to the presence of coherent atom-light and light-mechanics interactions at the quantum level. From the perspective of practical utilizations of these HAOM systems in future quantum devices, the understanding of the excitation dynamics as well as spectral features is crucial. In this poster, I'll present single-photon emission spectrum of an optomechanical cavity strongly coupled to two dipole-dipole interacting qubits (Optomechanical Tavis-Cummings model) [I. M. Mirza, Opt. Lett., 41, 11, (2016)]. Particularly, I'll discuss the influence of dipole-dipole interaction on the single photon spectrum under a strong qubit-cavity interaction. I'll also exhibit the amenability of model to the inclusion of mechanical losses and spontaneous emissions under a non-local Lindblad model.

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