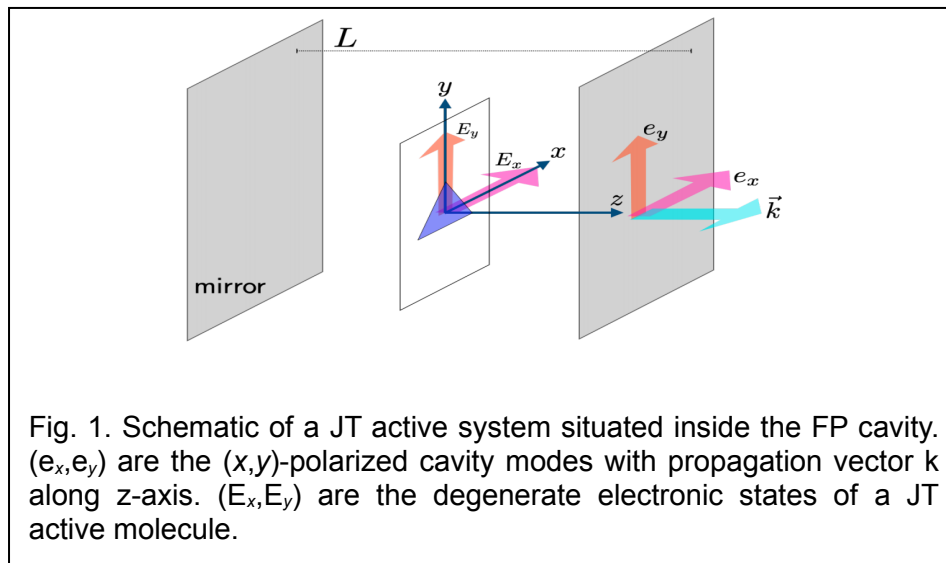


Cavity Jahn-Teller polaritons in molecules

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The control and exploitation of angular momentum and helicity of cavity photons constitutes one of the most active frontiers in the fields of polaritonic materials science [1] and polaritonic chemistry [2,3]. In our work [4], we have investigated the fundamental coupling mechanism of (+/-)-circular polarizations of the trapped-light modes originating from the vibronic interactions within the Jahn-Teller (JT) active molecules or material inside a Fabry-Perot (FP) cavity (cf. Fig. 1). The mechanism results in the efficient exchange of photonic and vibronic angular momenta between the light and the matter. It leads to a new type of polaritonic state with mixed polarization character, namely, the JT polariton. Due to the photonic-vibronic coupling, the magnitude and direction of the cavity polarization varies for different eigenstates of the cavity- molecule system. This type of light-matter coupling results in polarization inverted states in the polaritonic system: states that can be reached resonantly with either right or left circularly polarized light, but which are characterized by a cavity-photon polarization opposite to the external fields used to excite the system.



Reference

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