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Conical Intersections Induced by Quantum Light: Field-Dressed Spectra from the Weak to the Ultrastrong Coupling Regimes. AGNES VIBOK, University of Debrecen, TAMAS SZIDAROVSZKY, ATTILA G. CSASZAR, Eotvos Lorand University, LORENZ S. CEDERBAUM, University of Heidelberg, GABOR J. HALASZ, University of Debrecen — In classical laser fields with frequencies resonant with the electronic excitation in molecules, it is by now known that conical intersections are induced by the field and are called light-induced conical intersections (LICIs). As optical cavities have become accessible, the question arises whether their quantized modes could also lead to the appearance of LICIs. A theoretical framework is formulated for the investigation of LICIs of diatomics in such quantum light. The eigenvalue spectrum of the dressed states in the cavity is studied, putting particular emphasis on the investigation of absorption spectra of the Na_2 molecule, that is, on the transitions between dressed states, measured by employing a weak probe pulse. The dependence of the spectra on the light-matter coupling strength in the cavity and on the frequency of the cavity mode is studied in detail. The computations demonstrate strong nonadiabatic effects caused by the appearing LICI.

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