Optical channel interference: a general phenomenon in non-linear optical processes

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Abstract

Time-dependent perturbation theory explains the non-linear optical properties in terms of sum-over different electronic states of the systems and hence gives rise to a phenomenon called channel interference. It enables us to describe non-linear optical properties in terms of relative orientations of involved transition dipole moments. It was first coined much earlier in 2002 by Prof. Hans Ågren [1,2] in the study of two-photon absorption of some planar systems. Later the same is extended to three-dimensional cases by Chakrabarty et al. [3] in 2012, and very recently extended further to general multiphoton absorption, and to the first hyperpolarizability by Ruud et al. [4-6] Using this new description several works [7-10] are done by different researchers to understand the phenomenon of channel interference including its dependence on solvents and geometry of the molecular system. In this presentation, I'll present our contribution to this area and our latest progress.

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