Dipole-Induced Electromagnetic Transparency

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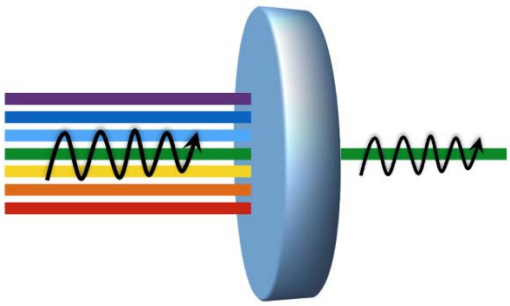
Electromagnetic Induced Transparency (EIT) is an optical technique used to render transparent to light an otherwise completely opaque medium. In practice, this medium can be an atomic gas, in which quantum interferences are induced between the atoms, the light pulse, and a second, ancillary control light beam. When the interference is destructive, the atoms stop absorbing photons of a specific wavelength for which full transparency is achieved. This phenomenon goes together with a drastic decrease of the speed of light, sufficient to completely stop and store a light pulse for up to a minute.

We have recently reported [*Phys. Rev. Lett.* **113**, 163603 (2014)] similar theoretical results using two-species dense gases where the destructive interference is driven by strong dipole-dipole interactions. The advantage is twofold: the ancillary coupling light beam is not required anymore and, more importantly, the wavelength of transparency can be controlled by merely changing the relative pressures of the gases. This Dipole Induced Electromagnetic Transparency (DIET) process extends recent work performed by Moshe Shapiro and collaborators [*J. Chem. Phys.* **137**, 094302 (2012)], and is expected, in the future, to become a regime offering potentialities for light trapping and photon information storage techniques.



Schematic view of the thin dense vapor of quantum emitters interacting with the incident field.