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Electromagnetically Induced Transparency and Nonlinear Optics in Mechanical Effects of Light

We consider the dynamical behavior of a nano mechanical mirror in a high quality cavity under the action of a coupling laser and a probe laser. We demonstrate the existence of the analog of EIT in the output field at the probe frequency. The opto mechanical system shares many of the features of the atomic Lambda systems. We further discuss the spontaneous generation of Stokes and anti-Stokes fields and the possibility of squeezing the nano mechanical system. We present results for both dispersive and reactive couplings.

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