

Abstract Submitted
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Cooperatively coupled motion with superradiant and subradiant atoms¹ GUIN-DAR LIN, KUAN-TING LIN, ER-SIANG TANG, National Taiwan University — We investigate the coupled motion of cooperative atoms subjected to the Doppler dissipative force. The dipole-dipole interaction introduces mutual decay channel and splits the super-radiant and sub-radiant states. The Doppler force is thus modified due to the collective emission and coupled recoil. Such a cooperative effect is more evident when the inter-atom separation is less than or comparable to a wavelength. In an optical molasses, we find that, along the axis of two atoms, there presents an effective potential with mechanically stable and unstable regions alternatively as their separation increases. Taking the cooperative Lamb shift into account, we map out the stability diagram and investigate the blockade effect.

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