

Fluctuating Forces Induced by Non Equilibrium and Coherent Light Flow:

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We show that mesoscopic coherent fluctuations of light propagating in random media induce fluctuating radiation forces. A hydrodynamic Langevin approach is used to describe the coherent light fluctuations, whose noise term accounts for mesoscopic coherent effects. This description -- generalizable to other quantum or classical wave problems -- allows to understand coherent fluctuations as a non-equilibrium light flow. The strength of these fluctuating forces is determined by a single dimensionless and tunable parameter, the conductance. Orders of magnitude of these fluctuation forces are offered which show experimental feasibility.