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Effects of laser linewidth on the back-action cooling of optomechanical resonators[1] GREGORY A. PHELPS, DANIEL S. GOLDBAUM, PIERRE MEYSTRE, University of Arizona — The effects of laser linewidth on the final temperature of a dynamical back-action cooled mirror in a Fabry-Pérot resonator coupled to an external phonon bath are examined. Classical Monte-Carlo techniques are used to model the colored laser noise with correlation function $< \phi(t)\ \phi(t')>=\exp(-|t-t'|/\tau)$ and mean $< \phi(t)>=0$. We present results of an analytical and numerical analysis that quantifies the final temperature of the mirror as a function of laser linewidth for experimentally realizable parameters.

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