

Quantum Physics

Towards a monolithic optical cavity for atom detection and manipulation

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We study a Fabry-Perot cavity formed from a ridge waveguide on a AlGaAs substrate. We experimentally determined the propagation losses in the waveguide at 780 nm, the wavelength of Rb atoms. We have also made a numerical and analytical estimate of the losses induced by the presence of the gap which would allow the interaction of cold atoms with the cavity field. We found that the intrinsic finesse of the gapped cavity can be on the order of $F \sim 30$, which, when one takes into account the losses due to mirror transmission, corresponds to a cooperativity parameter for our system $C \sim 1$.

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