

Abstract Submitted  
for the DAMOP15 Meeting of  
The American Physical Society

**Efficient loading of a BEC into a matter wave resonator**<sup>1</sup> VYACHESLAV LEBEDEV, CHANGHYUN RYU, MALCOLM BOSHIER, Physics Division, Los Alamos National Laboratory — Matter wave resonators have long attracted attention [1]. Their applications include velocity filtering, storage of BECs, and sensing. Resonant transmission of polaritons through a double barrier was recently observed [2], but cavities for cold atoms have not yet been created. The challenges here include creating suitable potentials and nonlinearity due to interatomic interactions. We present GPE simulation results which demonstrate that it is possible to realize a matter wave cavity resonator with the incident BEC propagating in an optical waveguide generated by the painted potential technique [3]. We will discuss the coupling of both interacting and non-interacting BECs into such resonators and the methods required to make the coupling efficient, along with experimental progress.

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<sup>1</sup>Supported by LANL/LDRD

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Date submitted: 30 Jan 2015

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