Condensed Matter > Quantum Gases

Continuous atom laser with Bose-Einstein condensates involving three-body interactions

A. V. Carpentier, H. Michinel, D. N. Olivieri, D. Novoa

(Submitted on 26 Feb 2010)

We demonstrate, through numerical simulations, the emission of a coherent continuous matter wave of constant amplitude from a Bose-Einstein Condensate in a shallow optical dipole trap. The process is achieved by spatial control of the variations of the scattering length along the trapping axis, including elastic three body interactions due to dipole interactions. In our approach, the outcoupling mechanism are atomic interactions and thus, the trap remains unaltered. We calculate analytically the parameters for the experimental implementation of this CW atom laser.

Comments:	11 pages, 4 figures
Subjects:	**Quantum Gases (cond-mat.quant-gas)**; Pattern Formation and Solitons (nlin.PS); Atomic Physics (physics.atom-ph)
Cite as:	**arXiv:1002.5014v1 [cond-mat.quant-gas]**

Submission history

From: Alicia Carpentier V [view email]
[v1] Fri, 26 Feb 2010 15:51:00 GMT (496kb)

Which authors of this paper are endorsers?