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Dynamics of a 3D Bose gas in an optical lattice driven by local particle loss[1] CHRISTOPHER MINK, AXEL PELSTER, MICHAEL FLEISCHHAUER, Department of Physics, University of Kaiserslautern, Germany — We study both the steady states and the dynamics of a weakly interacting Bose gas, which is confined by an optical lattice in one spatial dimension as well as an isotropic harmonic trap in the two transveral dimensions and is driven by a local particle loss. To this end we start from first principles and use coherent phase space methods in order to derive the underlying stochastic Gross-Pitaevskii description of the emerging Bose-Einstein condensate. Afterwards we neglect at first quantum fluctuations and determine approximately the condensate wave functions at each lattice site with a suitable variational ansatz. Then we take quantum fluctuations into account and study numerically their impact upon the time evolution of the system. With this we aim at reproducing the experimental results of Ref. [1] concerning the refilling dynamics of an empty site without any free parameters. Finally, we discuss the strengths of this model and demonstrate the limits of its applicability. [1] R. Labouvie, B. Santra, S. Heun, and H. Ott, Phys. Rev. Lett. 116, 235302 (2016)

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