

Open and driven quantum gases

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I will present three of our latest results on atomic quantum gases with engineered dissipation. This includes a joint work with the group of Artur Widera, where we investigate a phase transition in time during the transient relaxation dynamics of an open quantum systems [1], concepts for controlled state preparation using quantum feedback control in atomic cavities [2], as well as ideas preparation of interesting states using periodic driving in combination with engineered thermal baths [3].

[1] Dynamical phase transition in an open quantum system, Ling-Na Wu, Jens Nettersheim, Julian Feß, Alexander Schnell, Sabrina Burgardt, Silvia Hiebel, Daniel Adam, André Eckardt, Artur Widera, arXiv:2208.05164.

[2] Cooling and state preparation in an optical lattice via Markovian feedback control, Ling-Na Wu, André Eckardt, Phys. Rev. Research 4, L022045 (2022), arXiv:2106.03883; Quantum engineering of a synthetic thermal bath via Markovian feedback control, Ling-Na Wu, André Eckardt, SciPost Phys. 13, 059 (2022), arXiv:2203.15670; Heat transport in an optical lattice via Markovian feedback control, Ling-Na Wu, André Eckardt, New J. Phys. 24 123015 (2022), arXiv:2207.13622.

[3] Floquet-heating-induced Bose condensation in a scar-like mode of an open driven optical-lattice system, Alexander Schnell, Ling-Na Wu, Artur Widera, André Eckardt, Phys. Rev. A 107, L021301 (2023), arXiv:2204.07147.

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