Abstract Submitted
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Measuring time-dependent Greens Functions of strongly correlated gases in optical lattices[1] ADRIAN KANTIAN, DQMP, University of Geneva, ULRICH SCHOLLWÖCK, Department für Physik, LMU München, THIERRY GIAMARCHI, DQMP, University of Geneva — Recent advances in single-site addressing [1] in optical-lattice confined strongly correlated ultracold gases promise to deliver entirely new capabilities for these systems to serve as quantum simulators. We show how these advances may be employed to design in-situ measurements of both local and nonlocal time-dependent Greens functions as well as higher-order correlators. Using analytics side-by-side with time-dependent DMRG we quantify the practically available resolutions of these schemes - which can be applied for practically any 1D and 2D system of lattice-confined ultracold atoms - for several examples of interest, such as the mobile impurity problem [2] and the superfluid-Mott insulator transition.

[1] W. S. Bakr, et. al., Nature 462, 74 (2009); J. F. Sherson, et. al. Nature 467, 68 (2010).
[1] T. Fukuhara, et. al., Nat. Phys. 9, 235 (2013); [1] A. Kantian et. al., Phys. Rev. Lett. 113, 070601 (2014).

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