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Angle-resolved photoemission spectroscopy (ARPES) for quantum gas microscopes FABIAN GRUSDT, Ludwig Maximilian University of Munich, ANNABELLE BOHRDT, Technical University Munich, DANIEL GREIF, Harvard University, FRANK POLLMANN, MICHAEL KNAP, Technical University Munich, EUGENE DEMLER, Harvard University — Quantum gas microscopy provides a new perspective on strongly correlated quantum matter, such as the doped Fermi-Hubbard model. To connect such quantum simulation platforms with traditional solid state experiments, for example on the high- T_c cuprate superconductors, spectroscopic tools are required. In this talk, an experimental protocol is presented which allows to perform (the analogue of) angle-resolved photoemission spectroscopy in state-of-the-art quantum gas microscopes. Theoretical results for the $t - J$ model in one and two dimensions are presented for low doping. Our numerical studies can be explained theoretically by a microscopic parton picture, even on a quantitative level. The results presented in this talk pave the way, in the short term, towards spectroscopic studies of the pseudogap phase in the doped Hubbard model, and, in the long term, novel studies of exotic quantum spin liquids in optical lattices.

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