String Patterns in the doped Fermi-Hubbard Model
MUQING XU, CHRISTIE CHIU, GEOFFREY JI, Harvard University, ANNABELLE BOHRDT, MICHAEL KNAP, Technical University of Munich, EUGENE DEMLER, FABIAN GRUSDT, MARKUS GREINER, DANIEL GREIF, Harvard University — The simulation of strongly correlated systems with ultracold atoms has provided a great deal of flexibility in accessing different experimental regimes and constructing new observables. We use a quantum gas microscope to study the Fermi-Hubbard model with a fermionic Lithium-6 gas in a 2D square lattice. With an entropy redistribution technique, we realize long-range antiferromagnetic order across our sample, a disk spanning 8 sites. We hole dope the system away from half-filling and study the effects of holes on the antiferromagnetic order. Using the single-site-resolved detection provided by our microscope, we find string-like patterns formed by spins deviating from Nel order. We study temperature and doping dependence of these string-like patterns. We also study correlations of holes. Our real-space study may offer new perspectives into hole dynamics in the doped Fermi-Hubbard model.