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Detecting spin-entanglement dynamics with a quantum microscope MANUEL ENDRES, Harvard, LEONARDO MAZZA, DAVIDE ROSSINI, ROSARIO FAZIO, SNS Pisa, TAKESHI FUKUHARA, SEBASTIAN HILD, PETER SCHAUSS, IMMANUEL BLOCH, CHRISTIAN GROSS, MPQ Garching — In a first theory part, I will present new experimentally measurable lower bounds for the two-site entanglement of the spin-degrees of freedom of many-body systems with local particle-number fluctuations. The method aims at enabling the spatially resolved detection of spin-entanglement in Hubbard systems using high-resolution imaging in optical lattices. More generally, the scheme can simplify the entanglement detection in ion chains, Rydberg atoms, or similar atomic systems. Concerning the experimental implementatioin, I will present progress towards the observation of entanglement generation and spreading during spin impurity dynamics. Main reference: Leonardo Mazza *et al* 2015 *New J. Phys.* **17** 013015

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