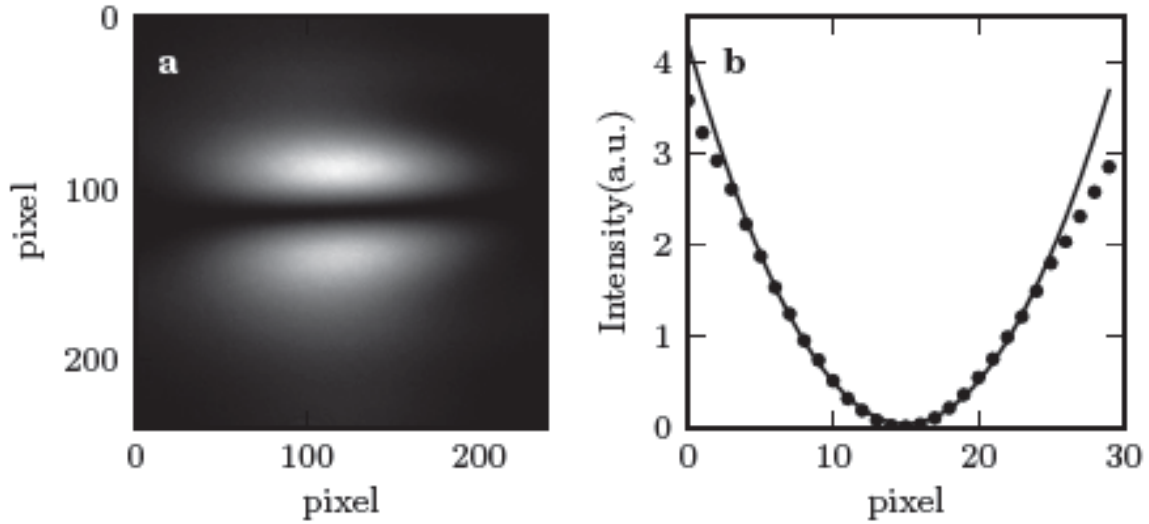
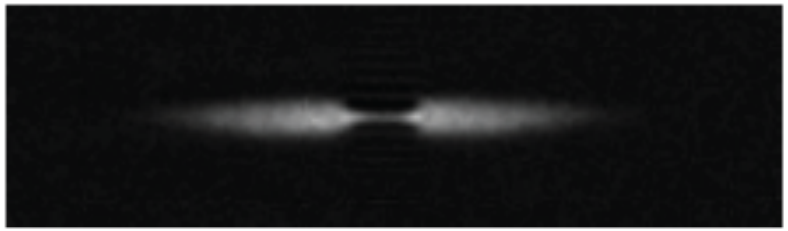
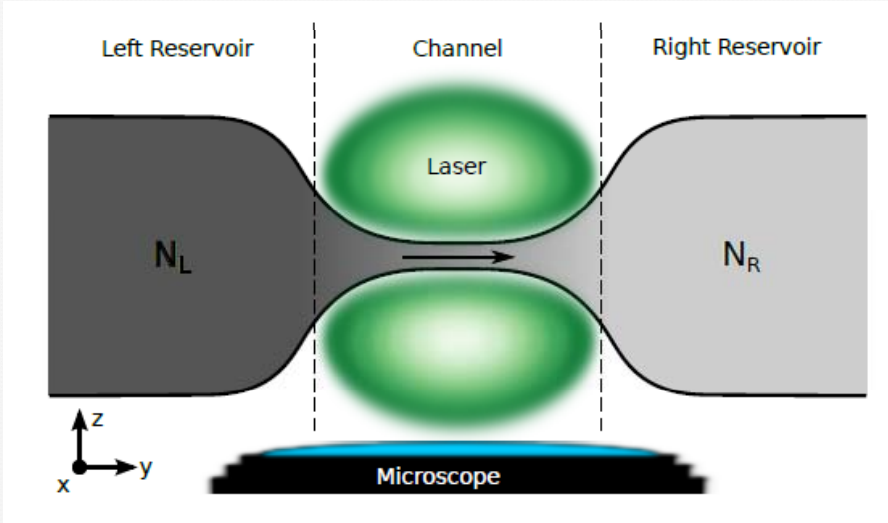
Creation of the setup

shaped laser beam to create channel



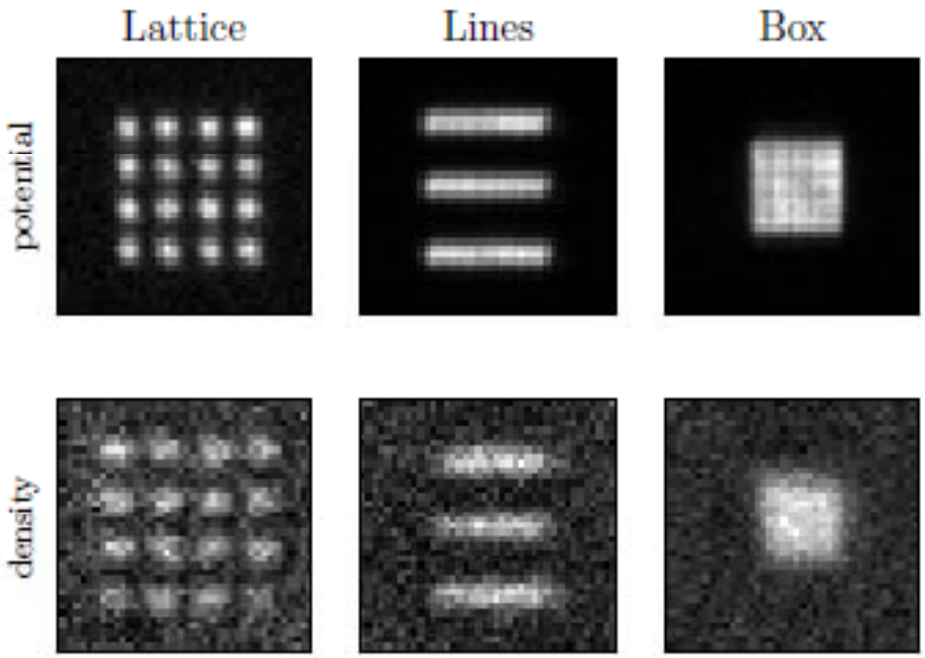
atom cloud in presence of channel (TOF)





J. Meineke, PhD thesis (2012)

Micropotentials in the channel



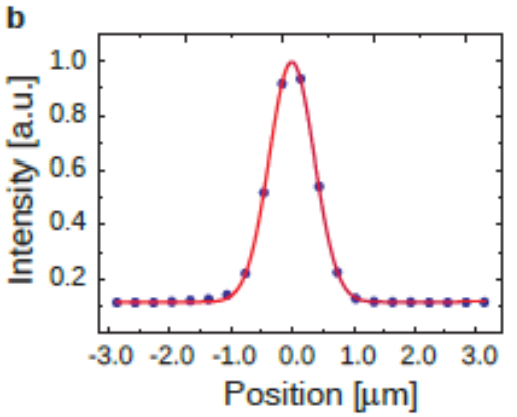


Figure 4.6.: Micro-potentials and the corresponding atomic distribution for a 4x4 site 2D lattice, three 1D lines, each line consisting of 7 individual spots, and a 2D box created by a closely spaced 5x5 site lattice. The second row of images shows the atomic density, averaged over 20 shots, obtained by absorption imaging. The number of atoms is roughly 5-10 per spot.

J. Meineke, PhD, (2012)

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Mass transport

density in the reservoirs

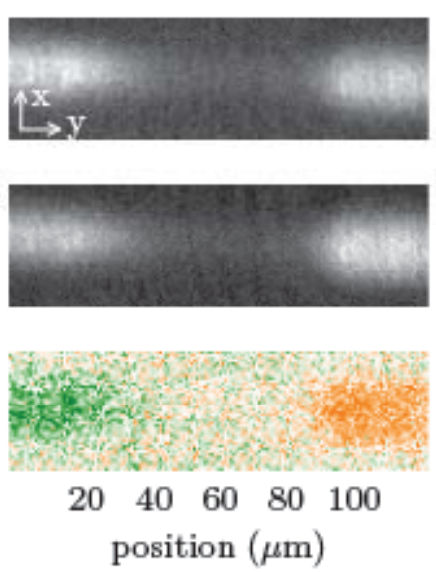
line density in the channel

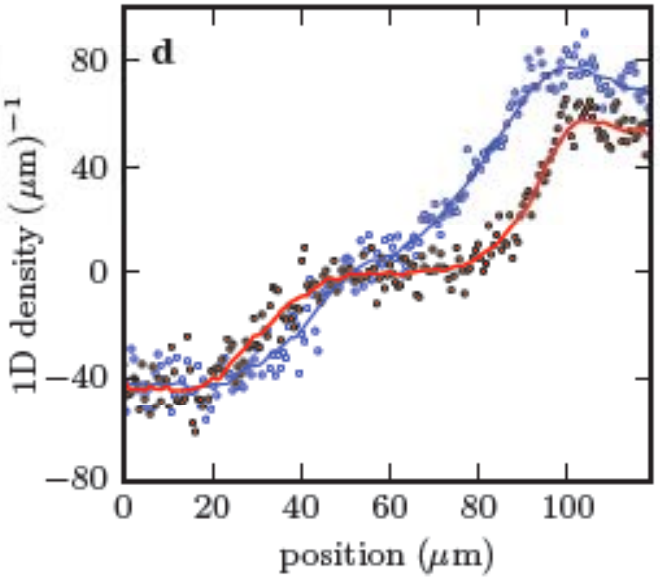
equilibrium

current flowing

difference:

orange>0





blue: diffusive

red: ballistic

J. Meineke, PhD thesis (2012)

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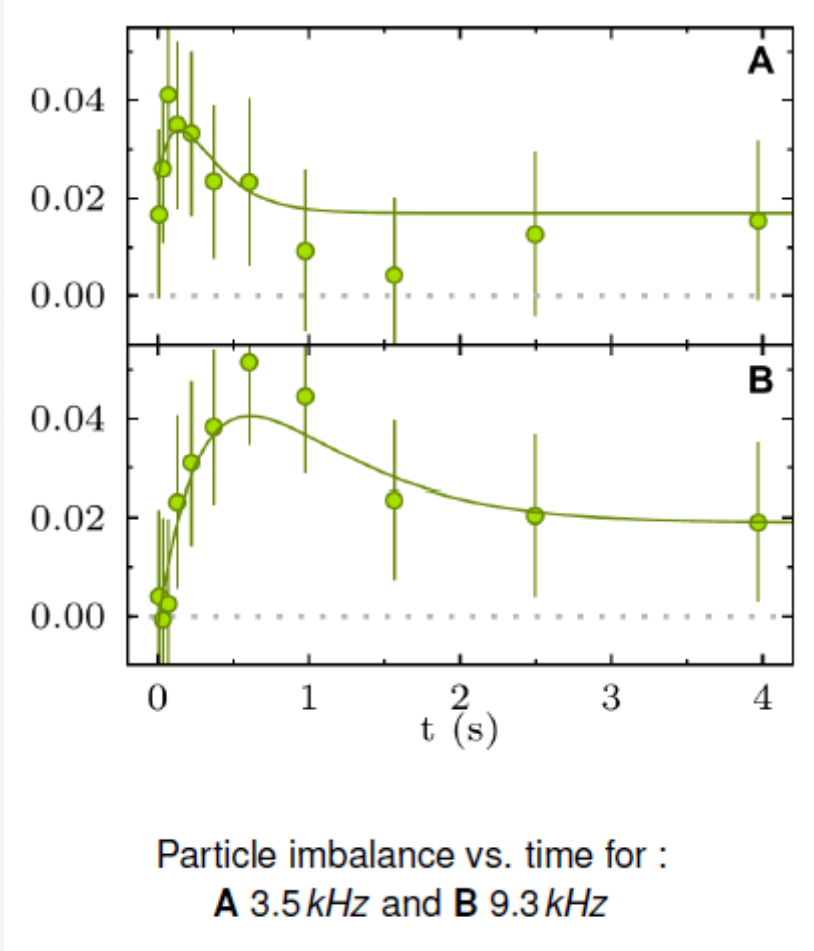
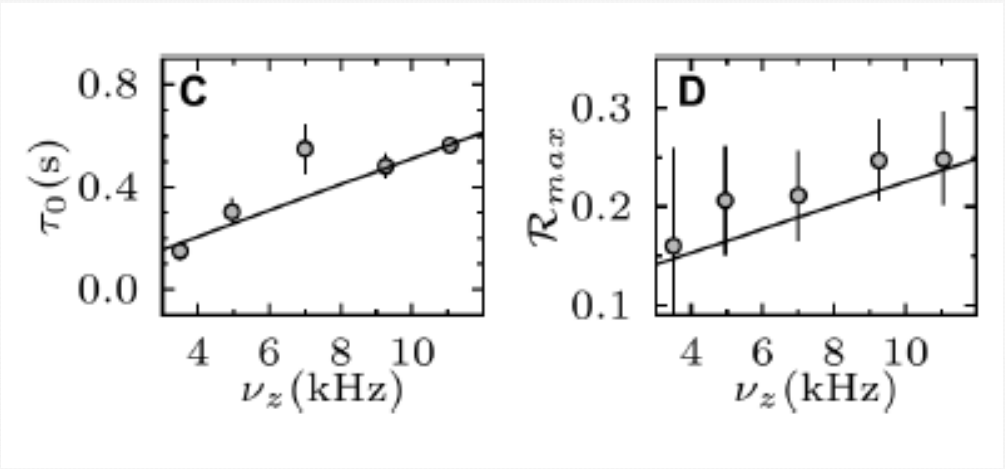
Results for ballistic channel

atom imbalance



Particle imbalance vs. time for :
A 3.5 *kHz* and **B** 9.3 *kHz*



R=dN/N/(dT0/TF)

JP Brantut et al., arXiv:1306.5754

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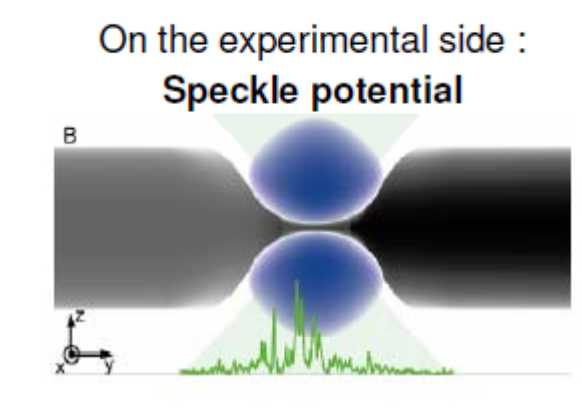
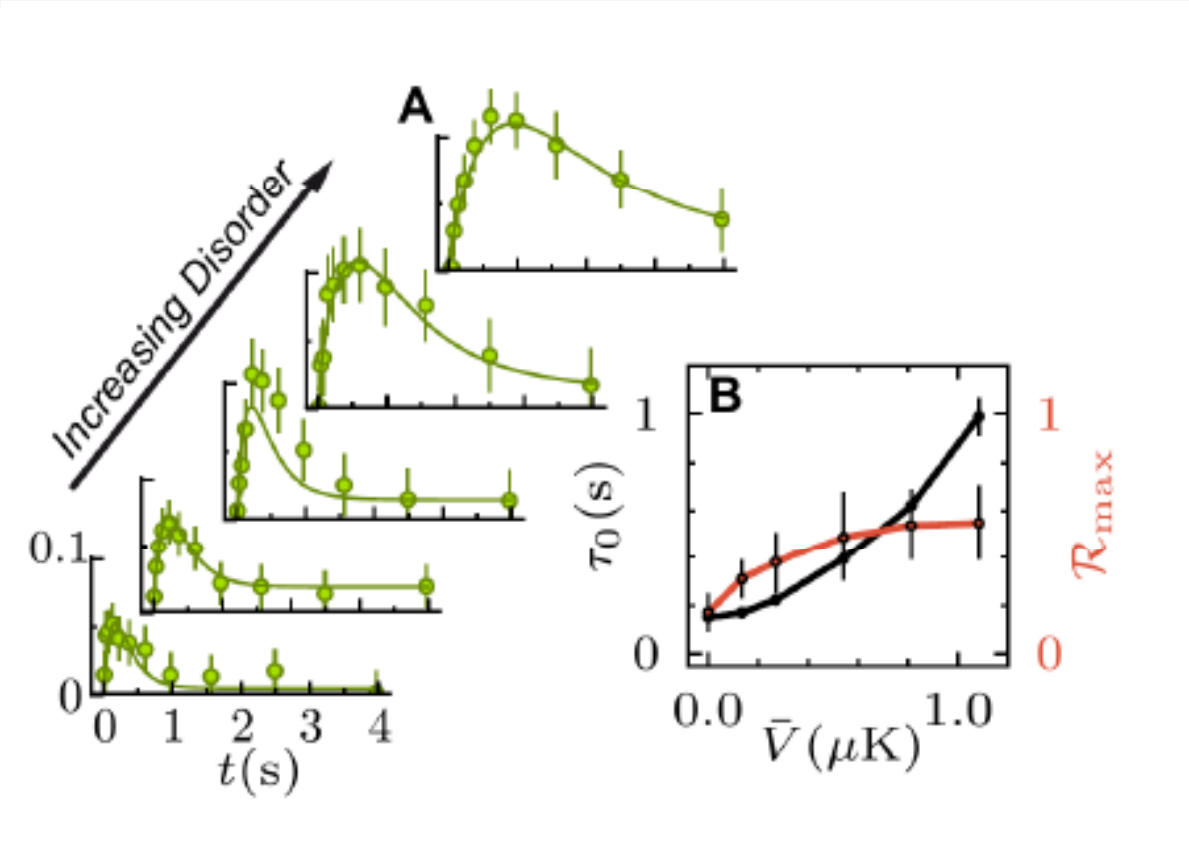
Disordered channel





Disorder effects increase the energy dependence of the transmission

JP Brantut et al., arXiv:1306.5754

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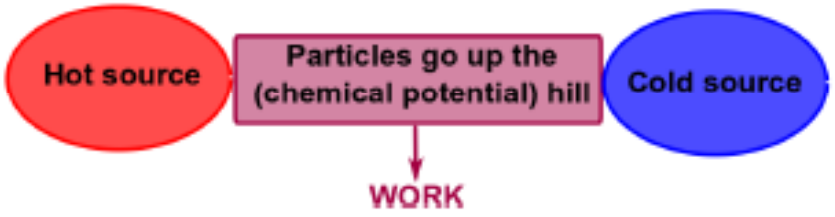
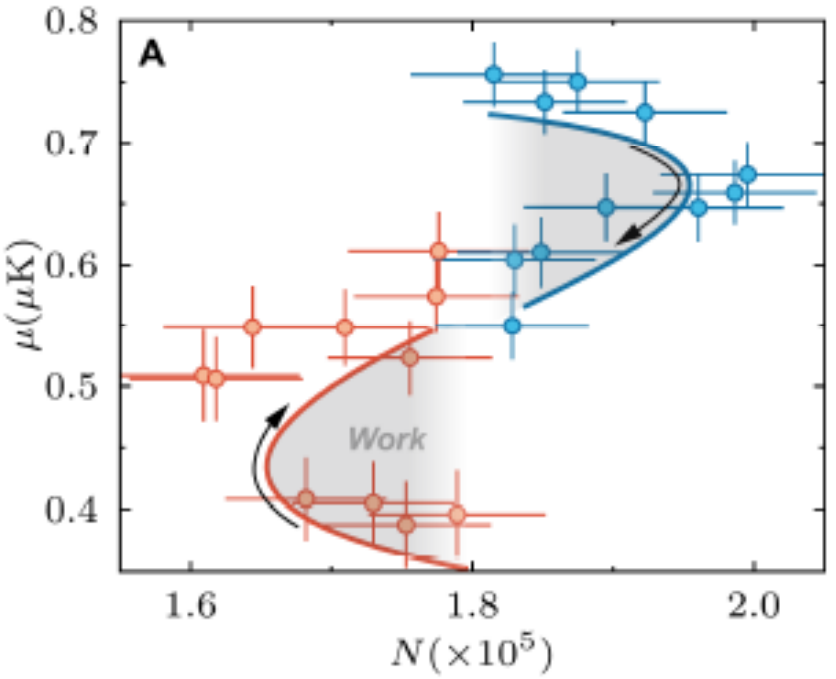
Heat engine



- Reservoirs ≡ Hot and Cold sources
- Channel : converts heat into (chemical) work



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JP Brantut et al., arXiv:1306.5754