

The Need For Speed



 \Rightarrow Faster spin dynamics within experimentally relevation

Implementation







Quantum Magnetism with ⁷Li

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) +
$$U_{\uparrow\downarrow} \sum_{i} n_{\uparrow\uparrow} n_{i\downarrow}$$

 $J = t^{2}/U$
 \downarrow
 $f(E_{R})^{3/4} e^{-\sqrt{V_{0}/E_{H}}}$
 $h(E_{R})^{3/4} E_{R}$
 $h($



Quantum Simulation

- Magnetic phase diagram







Spin Dynamics



(n) Prepare a spin mixture







Spin transport by super-exchange interactions

50-50 (o) Separate spins by (p) Apply optical lattice (q) Allow spins to mix (by magnetic field gradient





decreasing magnetic field gradient)