

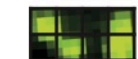
(a)Twin state
InitializationMany-body
interferenceSite-resolved
parity readout

Odd Even

A B
 A even $\rightarrow$ Pure
 A+B even $\rightarrow$ Pure

 $\rightarrow$ A and B product state

Mott insulator



A B
 A odd or even $\rightarrow$ mixed
 A+B even $\rightarrow$ pure
 $\rightarrow$ A and B entangled

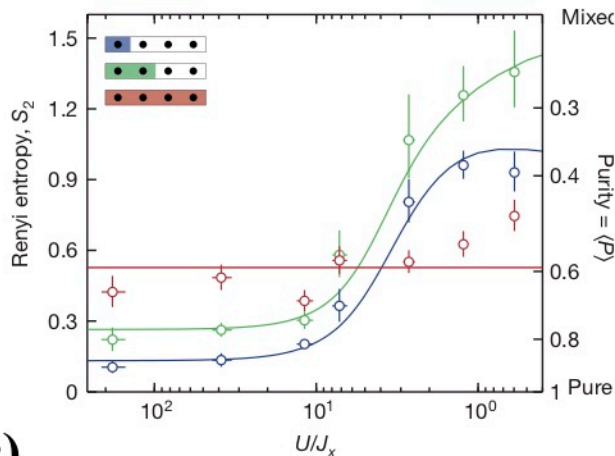
Superfluid

(b)

Mott insulator

Adiabatic melt $\rightarrow$

Superfluid

**(c)**