

Abstract Submitted  
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**Probing Ferromagnetic Order in Few-Fermion Correlated Spin-Flip Dynamics**<sup>1</sup> GEORGIOS KOUTENTAKIS, SIMEON MISTAKIDIS, PETER SCHMELCHER, University of Hamburg — We unravel the dynamical stability of a fully polarized one-dimensional ultracold few-fermion spin-1/2 gas subjected to inhomogeneous driving of the itinerant spins. Despite the unstable character of the total spin-polarization the existence of an interaction regime is demonstrated where the spin-correlations lead to almost maximally aligned spins throughout the dynamics. The resulting ferromagnetic order emerges from the build up of superpositions of states of maximal total spin. They comprise a decaying spin-polarization and a dynamical evolution towards an almost completely unpolarized NOON-like state.

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