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Quench dynamics of a spinor condensate with strong spin-dependent interactions HIL F H CHEUNG, YOGESH S PATIL, MUKUND VENGALATTORE, Cornell University — Spinor condensates exhibit a rich phase diagram of magnetically ordered phases arising from the interplay between spin-dependent interactions and superfluidity. The spinor condensates studied to date (^{87}Rb and ^{23}Na) exhibit weak spin-dependent interactions with little coupling between the spin (magnon) excitations and the mass (phonon) excitations. In contrast, the F=1 spinor condensates of ^{7}Li exhibit commensurate strengths of spin-dependent and spin-independent interactions, leading to qualitative changes in the equilibrium phases and spinor dynamics. We describe the quench dynamics of a ^{7}Li spinor gas between a spin nematic and ferromagnetic phase, discuss the emergent ferromagnetic spin texture and topological defects in accordance with the Kibble-Zurek mechanism and contrast this behavior with that observed in weakly interacting spinor condensates such as ^{87}Rb.

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