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Melting of a spin domain wall in the context of recent experiments with ultracold atoms LEV VIDMAR, Penn State University, DEEPAK IYER, Bucknell University, MARCOS RIGOL, Penn State University — When a one-dimensional spin domain wall of the form |up ... up up down down ... down>is melting, transverse spin correlations in the XX model exhibit a power-law decay in the melted region. This model can be mapped to hard-core bosons via Jordan-Wigner transformation. For hard-core bosons, these emerging power-law correlations correspond to singularities in the quasimomentum distribution at finite quasimomenta +/- pi/2, resulting in a dynamical quasicondensation with the emerging phase order different from the ground-state order. This phenomenon has been recently observed experimentally with ultracold bosons in optical lattices [1]. Here we study the emergence of correlations in melting domain walls for hard-core bosons, spinless fermions and the Fermi-Hubbard model at infinite onsite repulsion. In all cases, the density dynamics exhibit identical ballistic expansion, while the correlations show strikingly different features. References: [1] Vidmar et al, PRL 115, 175301 (2015)

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