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Topological spin-charge separation in one dimensional optical superlattices HAIPING HU, CHUANWEI ZHANG, The University of Texas at Dallas — Spin-charge separation is a hallmark phenomenon of 1D strongly interacting systems. However, whether spin and charge excitations in strong interacting region can possess non-trivial topological properties has not been explored. Here we show that topological spin-charge separation can be realized using ultracold fermions in a 1D optical superlattice. We demonstrate the emergence of topological magnetic excitations in a wide interaction regime through numerical density matrix renormalization group (DMRG) study. Such topological states are protected by a finite magnon excitation gap and characterized by gapless magnon edge state excitations. The magnon excitations can be quantized pumped between edges by adiabatically tuning the superlattice phases, realizing topological magnon pumping.

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