Abstract Submitted
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Entanglement in fermionic superlattices[1] RAIMUNDO DOS SANTOS, TIAGO MENDES-SANTOS, THEREZA PAIVA, Universidade Federal do Rio de Janeiro — We discuss how entanglement of strongly correlated fermions is influenced by a superlattice structure, by considering a one-dimensional Hubbard superlattice, made up of a repeated pattern of L_U repulsive sites followed by L_0 free sites. Lanczos diagonalization of lattices up to 24 sites are used to calculate the von Neumann entropy and the negativity. The breakdown of particle-hole symmetry broadens the maxima of the entropy in the underdoped region, while the entanglement in the overdoped region is crucially influenced by the nature of the magnetic state, with dips at densities corresponding to repulsive layer singlets and to $q = \pi$ (in units of inverse unit cell length, $L_U + L_0$) spin-density waves; at these special densities the system is either a Mott insulator or a 'compressible insulator'. We have also found that sites in the repulsive layer (for $L_U \geq 2$) are monogamically entangled with each other.

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