

Abstract Submitted
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Exact transformation for spin-charge separation of spin half fermions STELLAN ÖSTLUND, Göteborgs Universitet, MATS GRANATH — We demonstrate an exact local transformation which maps a purely Fermionic many-body system to a system of spinfull Bosons and spinless Fermions, demonstrating a possible path to a non-Fermi liquid state. We apply this to the half-filled Hubbard model and show how the transformation maps the ordinary spin half Fermionic degrees of freedom exactly and without introducing Hilbert space constraints to a charge-like “quasicharge” fermion and a spin-like “quasispin” Boson while preserving all the symmetries of the model. We present approximate solutions with localized charge which emerge naturally from the Hubbard model in this form. Our results strongly suggest that charge tends to remain localized for large values of the Hubbard U . The results suggest that checkerboard patterns are natural patterns that result for the strongly interacting Hubbard model away from half filling.

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