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**Spin-charge separation in one-dimensional fermion systems beyond Luttinger liquid theory** THOMAS SCHMIDT, Yale University, ADILET IMAMBEKOV, Rice University, LEONID GLAZMAN, Yale University — We develop a nonperturbative zero-temperature theory for the dynamic response functions of interacting one-dimensional spin-1/2 fermions. In contrast to the conventional Luttinger liquid theory, we take into account the nonlinearity of the fermion dispersion exactly. We calculate the power-law singularities of the spectral function and the charge- and spin-density structure factors for arbitrary momenta and interaction strengths. The exponents characterizing the singularities are functions of momenta and differ significantly from the predictions of the linear Luttinger liquid theory. We generalize the notion of the spin-charge separation to the nonlinear spectrum. This generalization leads to phenomenological relations between threshold exponents and the threshold energy.

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