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Spin and charge velocities of one-dimensional boson-fermion mixture¹ SHI-JIAN GU, Department of Physics and ITP, The Chinese University of Hong Kong, Hong Kong, China, JUNPENG CAO, Laboratory for Condensed Matter Physics, Institute of Physics, Chinese Academy of Sciences, Beijing 100080, China, HAI-QING LIN, Department of Physics and ITP, The Chinese University of Hong Kong, Hong Kong, China — We study the ground state and elementary excitations of a one-dimensional mixture of scalar bosons and spin-1/2 fermions with repulsive delta-function interaction by the Bethe-ansatz method. Though the ground state properties are dramatically changed once bosons are mixed into fermions, the spin and charge excitations still feature linear dispersions, and their velocities satisfy a simple universal relation.

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