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Decoupling transition in a one-dimensional fermionic gas interacting via a Feshbach resonance LEO RADZIHOVSKY, DANIEL SHEEHY, University of Colorado — We study a fermionic atomic gas confined to move in one dimension and interacting via an s-wave Feshbach resonance. At low energies the system is characterized by a model of two Josephson-coupled Luttinger liquids, corresponding to fermionic atoms and their diatomic molecules. In contrast to higher dimensions, we find that this system exhibits a quantum phase transition from a phase in which the two superfluids are strongly coupled to one where the Feshbach resonance coupling becomes irrelevant and the two types of superfluid decouple.

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