



Junctions of weakly-coupled strongly-interacting ultracold systems

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After briefly reviewing the use of ultracold atoms for the implementation of quantum devices, I discuss two examples of junctions made by strongly interacting systems weakly coupled between them. I present in the first part of the talk recent results on the Josephson dynamics of two ultracold fermionic gases at the unitary limit weakly linked by a controllable barrier. In the second part I discuss properties of 1D Bose gases and then of junctions of Tonks-Girardeau gases. When three Tonks-Girardeau gases are coupled, one can exactly map their Hamiltonian by means of a suitable Jordan-Wigner transformation into the Hamiltonian of the multichannel Kondo model. I will also show recent results on the experimental realization of Y-geometries with holographic traps.

