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Dimensional Crossover from 2D Fermi liquids to 1D Luttinger liquids[1] JIA-HUA GU, KAI SUN, Univ of Michigan - Ann Arbor — We demonstrate an analytic theory for the crossover between Fermi liquids and Luttinger liquids. By deforming the Fermi surface of a 2D Fermi liquid towards perfect nesting, we show that signatures of Luttinger liquids arise. In the crossover regime, bosonic particles emerge from the fermionic theory, whose the spectral weight characterize the crossover towards 1D Luttinger liquids. At perfect nesting, these bosonic modes recover the bosonizatoin formalism for Luttinger liquids. Spin-charge separation and instabilities due to attractive interactions are also studied.

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