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Interedge coherent line junctions in Quantum Hall systems EMILIANO PAPA, University of Virginia — In this talk I will address the properties of quantum Hall line junctions (QHLJ) that occur near barriers separating electron gases on quantum Hall plateaus. In narrow barriers where electron tunneling can occur at any point, the low energy physics of the QHLJ is described by the massive quantum sine-Gordon model. We propose procedures to study a sort of properties of these systems in relation with recent experimental studies. The spectrum of the quantum sine-Gordon model consists of topological particles, solitons, antisolitons, and when forward interactions are strong enough also their bound states can form. In presence of a chemical potential however that couples with these charges the spectral gap can be suppressed. When this chemical potential exceeds the mass of the soliton ($\Delta/2$), a finite density of solitons appears in the ground state, distributed on a Fermi sea according to their statistics, embedded in their interactions (or their scattering matrix). The low-energy physics of this system then will be of particle-hole type formed around these Fermi points. The properties of this metallic state, namely the value of the Luttinger liquid (LL) parameter K and the Fermi velocity can be accessed with the thermodynamic Bethe ansatz. Experimentally there are two quantities that offer the measurement of two combinations, the product and the ratio of the LL parameter K and the Fermi velocity, namely the Drude weight and charge susceptibility, respectively.

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