From Schrödinger dynamics to the Euler equations

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We show that, in the hydrodynamic limit, the Heisenberg dynamics of the energy, momentum, and particle densities for fermions with short-range pair interactions converges to the compressible Euler equations with the pressure function given by quantum statistical mechanics. Our derivation is based on a quantum version of the entropy method and a suitable quantum virial theorem. We require a number of technical conditions that will be discussed in the talk.