

SEMINAR

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Abstract

"Dynamics of quantum particles in one-dimensional quantum liquids"

What is the dynamics of a particle injected into a gas of quantum particles of other type? I will address this question in one spatial dimension in two different situations. In one case, an external particle is injected with a finite momentum, while as in the other the particle is subjected to a constant driving force. In the former case I will demonstrate that, contrary to conventional picture of relaxation dynamics, the particle never comes to a complete stop. Instead, for initially supersonic velocity long-lived oscillations develop and the velocity saturates to a value almost independent of initial conditions. In the latter case long-lived oscillations and velocity saturation take are also present, though their physical origin is different from the one in the former case. The methods used, namely Bethe Ansatz and numerics, will be discussed in detail along with the state-of-the-art experiments.

Reference:

Nature Physics 8, 881 (2012)

arXiv:1303.3583