Abstract Submitted
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Thermalization in 1d many body systems[1] I.E. MAZETS, J. SCHMIEDMAYER, Atominstitut, TU-Wien — We study the collisional processes that can lead to thermalization in one-dimensional systems. For two body collisions excitations of transverse modes are the prerequisite for energy exchange and thermalzation. At very low temperatures excitations of transverse modes are exponentially suppressed, thermalization by two body collisions stops and the system should become intrgrable. In quantum mechanics virtual excitations of higher radial modes are possible. These virtually excited radial modes give rise to effective three-body velocity-changing collisions which lead to thermalization (Mazets et al. PRL **100**, 210403 (2008). These three-body elastic interactions are suppressed by pair wise quantum correlations when approaching the strongly correlated regime. If the relative momentum k is small compared to the two-body coupling constant c the three-particle scattering state is suppressed by a factor of $(k/c)^{12,}$ which is proportional to the square of the three-body correlation function at zero distance (Mazets et al. PRA **79**, 061603 (2009). This suggests that in one dimensional quantum systems it is not the freeze-out of two body collisions but the strong quantum correlations which ensures integrability.

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Joerg Schmiedmayer
Atominstitut, TU-Wien

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