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Bldg. 222, Seminar room 13

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Three-body correlation function and recombination in one dimension out of equilibrium

We investigate local three-body correlations for bosonic particles in three and one dimensions as a function of the interaction strength. The three-body correlation function g_3 is determined by measuring the three-body recombination rate in an ultracold gas of Cs atoms. In three dimensions, we measure the dependence of g_3 on the gas parameter in a BEC, finding good agreement with the theoretical prediction accounting for beyond-mean-field effects. In one dimension, we observe a reduction of g_3 by several orders of magnitude upon increasing interactions from the weakly interacting BEC to the strongly interacting Tonks-Girardeau regime, in good agreement with predictions from the Lieb-Liniger model for all strengths of interaction.