ID de Contribution: **18**   Type: **Non spécifié**

Measuring the local rapidity distribution of 1D Bose gases

mercredi 7 février 2024 10:00 (45 minutes)

I will present joint work with Léa Dubois, Guillaume Thémèze Florence Nogrette and Isabelle Bouchoule (Institut d'Optique, Palaiseau, France) on the measurement of the local rapidity distribution in 1D Bose gases. 1D bosons with point-like interaction, also known as Lieb-Liniger gas, display peculiar dynamical behavior because they are (nearly) integrable. The rapidities of a 1D Bose gas are the asymptotic momenta of the atoms, which can be measured by 1D time of flight.

It is now established that the rapidity distribution entirely characterizes these 1D gases after relaxation, and over the past few years the rapidity distribution has become the central concept in the study of their dynamics, both theoretically with the advent of Generalized Hydrodynamics in 2016 and experimentally with first measurements of the global rapidity distribution performed in 2020 by the group of David Weiss.

Here I will discuss a new experimental protocol to access the spatially resolved distribution of rapidities in the Palaiseau experiment, which should ultimately allow to experimentally map out the entire state of the gas and measure the phase-space distribution of quasi-particles. I will argue that this can be done by performing a one-dimensional expansion of a selected zone of the gas, and I will discuss new experimental results

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