



# Hard rod hydrodynamics and the Lévy Chentsov field

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**Abstract.** We study the hydrodynamics of the hard rod model proposed by Boldrighini, Dobrushin and Soukhov by describing the displacement of each quasiparticle with respect to the corresponding ideal gas particle as a height difference in a related field. Starting with a family of nonhomogeneous Poisson processes contained in the position-velocity-length space  $\mathbb{R}^3$ , we show laws of large numbers for the quasiparticle positions and the length fields, and the joint convergence of the quasiparticle fluctuations to a Lévy Chentsov field. We allow variable rod lengths, including negative lengths.

**Keywords.** Hard rods, hydrodynamics, Lévy Chentsov field.