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Forum de Physique Statistique @ ENS

Mercredi 5 Janvier 2022, 14 :30
LPENS, L367(please inquire xiangyu.cao@ens.fr for a zoom link)
Domaines : cond-mat.stat-mech

Titre : *Generalised Density Profiles in Single-File Systems*

Orateur : **Aurélien Grabsch (LPTMC)**

Résumé : *Single-file transport, where particles diffuse in narrow channels while not overtaking each other, is a fundamental model for the tracer subdiffusion observed in confined systems, such as zeolites or carbon nanotubes. This anomalous behavior originates from strong bath-tracer correlations in 1D, which we characterise in this talk through Generalised Density Profiles (GDPs). These GDPs have however remained elusive, because they involve an infinite hierarchy of equations. Here, for the Symmetric Exclusion Process, a paradigmatic model of single-file diffusion, we break the hierarchy and unveil a closed equation satisfied by these correlations, which we solve. Beyond quantifying the correlations, the central role of this equation as a novel tool for interacting particle systems will be further demonstrated by showing that it applies to out-of equilibrium situations, other observables and other representative single-file systems.*

Refs :

** Generalized Correlation Profiles in Single-File Systems Alexis Poncet, Aurélien Grabsch, Pierre Illien, Olivier Bénichou Phys. Rev. Lett. 127, 220601 (2021) arXiv :2103.13083*

** Closing and Solving the Hierarchy for Large Deviations and Spatial Correlations in Single-File Diffusion Aurélien Grabsch, Alexis Poncet, Pierre Rizkallah, Pierre Illien, Olivier Bénichou arXiv :2110.09269*