The current distribution of the pushing asymmetric simple exclusion process

Eunghyun Lee, University of Helsinki

We report some exact results on the pushing asymmetric simple exclusion process (PushASEP) which is believed to be in the KPZ universality class. The transition probability of the PushASEP is provided by using the Bethe ansatz and the current distribution of the N-particle system with arbitrary initial configuration is obtained from the transition probability. We show that the current distribution for step Bernoulli initial condition is represented by a Fredholm determinant in the limit that N goes to infinity, and finally we discuss how the GUE Tracy-Widom distribution can emerge in the PushASEP. The results in this talk can be considered as a partial extension of Borodin and Ferrari's result (2008) on the one-sided PushASEP and also this work is the PushASEP version of Tracy and Widom's work on ASEP (2008).

References

[1] Lee, E.: Transition probabilites of the Bethe ansatz solvable interacting particle systems. J. Stat. Phys., **142**, 643{656 (2011)

[2] Lee, E.: The current distribution of the multiparticle hopping asymmetric diffusion model. arXiv:1203.0501