

## **A Useful Integral Representation in ASEP**

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This is joint work with Craig Tracy. We start with a formula -- an infinite series of multiple integrals -- for the probability distribution for an individual particle in the asymmetric simple exclusion process on the integers. In the case of step initial condition (particles initially at the positive integers), this sum can be represented in terms of the Fredholm determinant of a certain integral operator. We describe how one finds a useful integral representation of a kernel acting on a different space but having the same Fredholm determinant. "Useful" means amenable to asymptotic analysis. It is straightforward, using this representation, to establish KPZ universality for ASEP. This generalizes a result of Johansson for TASEP.