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Current distribution for a two-species particle model from first principles

We rigorously derive a joint universal KPZ current distribution from first principles in the integrable two-species Arndt-Heinzel-Rittenberg (AHR) model. This result follows from exact multiple contour expressions for the Green's function and a joint current probability, and a subsequent asymptotic analysis of these integrals via a Fredholm determinant. It is the first such rigorous result for a two-species Markov chain, confirming heuristic predictions from nonlinear fluctuating hydrodynamics (NLFH).