MARKOV DYNAMICS ON INTERLACING ARRAYS

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Since the end of 1990's there has been a significant progress in understanding the long time nonequilibrium behavior of certain integrable (1+1)-dimensional interacting particle systems and random growth models in the Kardar-Parisi-Zhang (KPZ) universality class. The miracle of integrability in most cases (with the notable exception of the partially asymmetric simple exclusion process) can be traced to an extension of the Markovian evolution to a suitable (2+1)-dimensional random growth model whose remarkable properties yield the solvability. So far, there have been two sources of such extensions. The first one originated from a classical combinatorial bijection known as the Robinson-Schensted-Knuth correspondence (RSK, for short) in the works of Johansson, O'Connell and their co-authors. The second approach introduced by Borodin-Ferrari was based on an idea of Diaconis-Fill of extending intertwined "univariate" Markov chains to a "bivariate" Markov chain that projects to either of the initial ones.

In a recent joint work with A.Borodin, we presented a way to unify these two approaches using a fairly general framework of Macdonald processes. This also provides new examples of integrable KPZ particle systems.