

Determinantal Structures in the q -Whittaker Measure

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The q -Whittaker measures are probability measures on partition and are written in terms of a product of two q -Whittaker functions. Since the introduction by Borodin and Corwin in 2011, it has been playing an important role in recent progresses in the integrable probability. Their interesting feature is that the q -Laplace transform of some marginal distributions can be represented as a single Fredholm determinant, from which we can analyze asymptotic behavior of interacting particle processes belonging to the KPZ class. The Fredholm determinant formula was first obtained by Borodin-Corwin by using Macdonald difference operator. Since then, various techniques such as Markov duality, the Yang-Baxter equation etc, have been developed to obtain the determinantal formulas for more generalized setting. All these techniques focus on some mathematical structures of q -moments of some observables.

In this talk, I will talk on another approach to analyze the q -Whittaker measures without relying on the q -moments. We utilize the Ramanujan summation formula and an elliptic version of the Cauchy determinant identity. We also discuss some relations of the q -Whittaker measures to determinantal point processes. This is the joint work with Matteo Mucciconi and Tomohiro Sasamoto.