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Total integrals of Painlevé functions

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Abstract

The Tracy–Widom distributions appearing in random matrix theory can be expressed in terms of a definite integral involving a Painlevé II function. The total integral (the integral on the entire real line) of this Painlevé function leads to asymptotic information about the Tracy–Widom distributions. I will discuss a new technique of computing the total integral of Painlevé II functions using Riemann–Hilbert analysis.

This is joint work with Jinho Baik, Robert Buckingham, and Alexander Its.