

ORTHOGONAL POLYNOMIALS AND PAINLEVE' EQUATIONS

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Asymptotics of the orthogonal polynomials constitute a classic analytic problem. A distribution of zeroes to generalized Hermite polynomials is studied in some scaling limit. These polynomials defined as Wronskians of classic Hermite polynomials appear in a number of mathematical physics problems as well as in the theory of random matrices. Calculation of asymptotics is based on Riemann – Hilbert problem for Painlevé IV equation which has solutions expressed in terms of these polynomials. In this scaling limit the Riemann – Hilbert problem is solved in elementary functions. As a result, we come to analogs of Plancherel – Rotach formulas for asymptotics of classical Hermite polynomials.

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