

## Probabilities in GUE and JUE under double scaling

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The probability that a gap  $(-t, t)$  is formed in the ground state of **finite density** impenetrable bosons in one dimension was shown by Jimbo-Miwa-Mori-Sato (1979) to be associated with a parameter free Painleve V. The large  $t$  asymptotic expansion gap probability has a constant  $t$  independent term—Widom-Dyson constant constant. Obtained by Widom (1973) in a problem on  $(n \times n)$  Toeplitz determinant, where the generating function vanishes on an arc. See also Torsten Ehrhardt. I will show how this and other constants, which occur in the Smallest Eigenvalue distribution of Jacobi Unitary Ensembles can be obtained through Linear Statistics formulas.