

Mathematical Physics

On the Efetov-Wegner terms by diagonalizing a Hermitian supermatrix

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The diagonalization of Hermitian supermatrices is studied. Such a change of coordinates is inevitable to find certain structures in random matrix theory. However it still poses serious problems since up to now the calculation of all Rothstein contributions known as Efetov-Wegner terms in physics was quite cumbersome. We derive the supermatrix Bessel function with all Efetov-Wegner terms. As applications we consider representations of generating functions for Hermitian random matrices with and without an external field as integrals over eigenvalues of Hermitian supermatrices. All results are obtained with all Efetov-Wegner terms which were unknown before.

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