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Dirichlet Distribution and Orbital Measures

The starting point of this paper is an observation by Okounkov concerning the projection of orbital measures for the action of the unitary group $U(n)$ on the space $\mathrm{Herm}(n, \mathbb{C})$ of $n \times n$ Hermitian matrices. The projection of such an orbital measure on the straight line generated by a rank one Hermitian matrix is a probability measure whose density is a spline function. More generally we consider the projection of orbital measures for the action of the group $U(n, \mathbb{F})$ on the space $\mathrm{Herm}(n, \mathbb{F})$ for $\mathbb{F} = \mathbb{R}$, $\mathbb{C}$, $\mathbb{H}$, and their relation with Dirichlet distributions.

Keywords: Dirichlet distribution, orbital measure, Markov-Krein correspondence, spline function, Jack polynomial.

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