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Asymptotic Harmonic Analysis on the Space of Square Complex Matrices

This paper is largely of expository nature. We determine the spherical functions of positive type on the space $V_\infty = M(\infty, \mathbf{C})$ relatively to the action of the product group $K_\infty = U(\infty) \times U(\infty)$. The space V_∞ is the inductive limit of the spaces of square complex matrices $V_n = M(n, \mathbf{C})$, and the group K_∞ is the inductive limit of the product groups $K_n = U(n) \times U(n)$, where $U(n)$ is the unitary group.

Keywords: Square complex matrices, unitary group, inductive limit, function of positive type, spherical function, ergodic measure, generalized Bochner theorem.

MSC: 22E30; 43A35, 43A85, 43A90