On spherical expansions of zonal functions on complex spheres and some of its applications

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Abstract: In the talk we will present results concerning expansions of zonal functions on a Euclidean sphere into spherical harmonics and some of their applications. The method used to derive the expansion formula is based entirely on differential methods and completely avoids the use of various integral identities commonly used in this context. We transfer this method on zonal functions on the sphere in finite dimensional space $\mathbb{C}^n$ (corresponding to even dimensional Euclidean space $\mathbb{R}^{2n}$). As application we give new proof of the expansion of the Poisson kernel for the unit ball and in complex case the expansion of the Poisson–Szegö kernel.

[1] A New Form of the Spherical Expansion of Zonal Functions and Fourier Transforms of SO(d)-Finite Functions, SIGMA 2 (2006), 033