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Section:

7. Lie Groups and Lie Algebras

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On Bernstein polynomials for compact Lie groups

Let $A(G)$ be the ring of representative functions on a compact connected Lie group G. By the theory of D-modules, given $f \in A(G)$, we have the following functional equation $D(g,s)(f(g))^{s+1} = b(s)(f(g))^s$ where $D(g,s)$ belongs to the ring of differential operators $\mathcal{D}(G)[s]$ and $b(s) \in \mathbb{C}[s]$. The monic polynomial of minimal degree which satisfies this equation is called the *Bernstein polynomial* attached to f. We give the Bernstein Polynomials for basic matrix entries of irreducible unitary representations of compact Lie group $SU(2)$, an application to the analytic continuation of certain distributions on $SU(2)$ and we describe the Bernstein polynomial for $B_- \times B$-semi-invariant functions on a semisimple complex Lie group.

Reference: Carina Boyallian, On Bernstein polynomials for compact Lie groups. Partially accepted in Journal of Algebra.