SPHERICAL ANALYSIS ON SECTIONS OF HOMOGENEOUS BUNDLES AND STRONG GELFAND PAIRS

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Let (G, K) be a Gelfand pair, with G of polynomial growth. The Gelfand spectrum Σ of $L^1(K\backslash G/K)$ admits natural embeddings in some $\mathbb{R}^k$.

When G is a semidirect product $G = K \ltimes H$, bi-K-invariant functions on G are identified with K-invariant functions on H. It has been proved for many pairs of this kind, with H nilpotent, that the spherical transform is a bijection from the space of K-invariant Schwartz functions on H to restrictions to Σ of Schwartz functions on $\mathbb{R}^k$ (Schwartz correspondence).

In this talk we look at Gelfand pairs in which K is contained in H and acts on it by inner automorphisms (K-central functions).

As a first step in the study of the Schwartz correspondence for these pairs,

(i) we present some preliminary material, concerning spoherical analysis on sections of homogeneous bundles (joint work with A. Samanta),

(ii) we prove the Schwartz correspondence for the two-dimensional complex motion group $H = U_2 \ltimes \mathbb{C}^2$ (joint work with F. Astengo and B. Di Blasio).