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Nilpotent Gelfand pairs and Schwartz extensions of spherical transforms via quotient pairs

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**NILPOTENT GELFAND PAIRS
AND SCHWARTZ EXTENSIONS OF SPHERICAL TRANSFORMS
VIA QUOTIENT PAIRS**

VÉRONIQUE FISCHER, FULVIO RICCI, OKSANA YAKIMOVA

ABSTRACT. It has been shown [1, 2, 9, 10] that for several nilpotent Gelfand pairs (N, K) (i.e., with N a nilpotent Lie group, K a compact group of automorphisms of N and the algebra $L^1(N)^K$ commutative) the spherical transform establishes a 1-to-1 correspondence between the space $\mathcal{S}(N)^K$ of K -invariant Schwartz functions on N and the space $\mathcal{S}(\Sigma)$ of functions on the Gelfand spectrum Σ of $L^1(N)^K$ which extend to Schwartz functions on \mathbb{R}^d , once Σ is suitably embedded in \mathbb{R}^d . We call this *property (S)*.

We present here a general bootstrapping method which allows to establish property (S) to new nilpotent pairs (N, K) , once the same property is known for a class of *quotient pairs* of (N, K) and a K -invariant form of Hadamard formula holds on N .

We finally show how our method can be recursively applied to prove property (S) for a significant class of nilpotent Gelfand pairs.

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