Spaces of Bounded Spherical Functions for Irreducible Nilpotent Gelfand Pairs: Part II

In prior work an orbit method, due to Pukanszky and Lipsman, was used to produce an injective mapping \( \Psi: \Delta(K, N) \to \mathfrak{n}^*/K \) from the space of bounded \( K \)-spherical functions for a nilpotent Gelfand pair \((K, N)\) into the space of \( K \)-orbits in the dual for the Lie algebra \( \mathfrak{n} \) of \( N \). We have conjectured that \( \Psi \) is a topological embedding. In this paper we complete the proof of this conjecture under the hypothesis that \((K, N)\) is an irreducible nilpotent Gelfand pair. Following Part I of this work it remains to verify the conjecture in six exceptional cases from Vinberg’s classification of irreducible nilpotent Gelfand pairs.

**Keywords:** Gelfand pairs, spherical functions, nilpotent Lie groups, orbit method.

**MSC:** 22E30, 43A90.