Abstract

Let $\mathcal{S}(X)$ be the Schwartz space of compactly supported smooth functions on the p-adic points of a spherical variety X, and let $\mathscr{C}(X)$ be the space of Harish-Chandra Schwartz functions. Under assumptions on the spherical variety, which are satisfied when it is symmetric, we prove Paley–Wiener theorems for the two spaces, characterizing them in terms of their spectral transforms. As a corollary, we get relative analogs of the smooth and tempered Bernstein centers — rings of multipliers for $\mathcal{S}(X)$ and $\mathscr{C}(X)$. When X = a reductive group, our theorem for $\mathscr{C}(X)$ specializes to the well-known theorem of Harish-Chandra, and our theorem for $\mathcal{S}(X)$ corresponds to a first step — enough to recover the structure of the Bernstein center — towards the well-known theorems of Bernstein [**Ber**] and Heiermann [**Hei01**].