

# Supercuspidal Representations Attached to Symmetric Spaces

Jeff Hakim

`jhakim@american.edu`  
American University, USA

For certain subgroups  $H$  of a  $p$ -adic group  $G$ , we compute the space  $\text{Hom}_H(\pi, 1)$  of  $H$ -invariant linear forms on the space of an irreducible, supercuspidal representation  $\pi$  of  $G$ . The representations for which the latter space is nonzero may be regarded as precisely those representations which contribute to the harmonic analysis on  $H \backslash G$ . For some pairs  $(G, H)$ , which we call “supercuspidal Gelfand pairs,” we can show that this  $\text{Hom}$ -space has dimension at most one for all such  $\pi$ , even though this property may fail to hold for nonsupercuspidal representations. This multiplicity one property has a variety of applications to harmonic analysis on  $H \backslash G$  and to the theory of automorphic representations. (Some of the results discussed were obtained jointly with Fiona Murnaghan.)