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**Wilfried Schmid\*** ([schmid@math.harvard.edu](mailto:schmid@math.harvard.edu)), Department of Mathematics, 1 Oxford Street, Cambridge, MA 02138. *On the rapid decay of cuspidal automorphic forms.*

Cuspidal automorphic forms decay rapidly on Siegel sets. This fact is frequently used to establish the analytic continuation and functional equations of L-functions. Certain arguments, in particular Rankin-Selberg type integrals that also involve unipotent integrations, depend on the rapid decay on sets larger than Siegel sets. In the case of the exterior square L-function for  $GL(n)$ , Jacquet-Shalika carefully establish the decay on the required type of set. Several authors subsequently referred to the Jacquet-Shalika argument as justification for the convergence of integrals these authors were considering. In some of these cases, the Jacquet-Shalika argument does not apply, resulting in a significant gap in the literature on L-functions. I shall describe a general criterion covering all of these cases. In addition, our argument applies to all smooth cuspidal automorphic forms, not just those that are K-finite, as is commonly assumed. In addition, these arguments show that for smooth, not necessarily K-finite cuspidal automorphic forms, moderate growth implies uniformly moderate growth, and hence rapid decay. This is joint work with Steve Miller. (Received February 02, 2011)