MULTIPLICITY ONE THEOREMS: THE ARCHIMEDEAN CASE

Chen-Bo Zhu
National University of Singapore

Abstract: Let $G$ be one of the classical Lie groups $\text{GL}_n(\mathbb{R})$, $\text{GL}_n(\mathbb{C})$, $\text{O}(p, q)$, $\text{O}_n(\mathbb{C})$, $\text{U}(p, q)$, and let $G'$ be respectively the subgroup $\text{GL}_{n-1}(\mathbb{R})$, $\text{GL}_{n-1}(\mathbb{C})$, $\text{O}(p, q - 1)$, $\text{O}_{n-1}(\mathbb{C})$, $\text{U}(p, q - 1)$, embedded in $G$ in the standard way. We show that every irreducible Harish-Chandra smooth representation of $G'$ occurs with multiplicity at most one in every irreducible Harish-Chandra smooth representation of $G$. This is joint work with Binyong Sun of the Chinese Academy of Sciences.

Independently and in a different approach, A. Aizenbud and D. Gourevitch have proved the multiplicity one theorems for the pairs $(\text{GL}_n(\mathbb{R}), \text{GL}_{n-1}(\mathbb{R}))$ and $(\text{GL}_n(\mathbb{C}), \text{GL}_{n-1}(\mathbb{C}))$. 
