

Title: Disjointness of models.

Abstract: Let $G_n = \mathrm{GL}_n(F)$ be the general linear group and let $M = G_p \times G_q$ be a maximal Levi subgroup of G_n . Let $U := U_n$ be the maximal unipotent subgroup of G_n . Let ψ be the non-degenerate character of U . Let (π, V) be an irreducible smooth representation of G_n . Assume $n = p + q$ with $p > q + 1$. Then using the theory of distribution we proved that

$$\dim \mathrm{Hom}_{\mathrm{GL}_p(F) \times \mathrm{GL}_q(F)}(V, \mathbb{C}) \cdot \dim \mathrm{Hom}_U(V, \psi) = 0.$$

In other words, if a generic representation of $\mathrm{GL}_n(F)$ have a linear model with respect to $\mathrm{GL}_p(F) \times \mathrm{GL}_q(F)$ then either $p = q$ or $p = q + 1$. When F is a p -adic field, this result is proved by Nadir Matringe by different method. Further, we study non-generic representation of $\mathrm{GL}_n(F)$ and describe their possible models. Our proofs are uniform and works for F finite, p -adic and real field. This is a joint work with Eitan Sayag.