Invariant distributions and Kirillov's conjectures

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The study of restricted representations is a vast area in Representation Theory of Lie groups. In general, irreducibility of unitary representations is a property not preserved by restriction to a subgroup. Kirillov's conjecture says that this is not the case for the group $G = GL(n, \mathbb{R})$ and the subgroup P that less invariant the vector $(0, \ldots, 1)$; that is every restricted unitary representation is irreducible in this case. Barush proved it some years ago [Annals of Math. 158 (2003), 207-252]. The proof is based on a stronger analogue of the Regularity Theorem of Harish-Chandra for this case combined with a detailed study of nilpotent orbits. In a joint work with Yves Laurent, we can obtain another proof of Kirillov's conjecture using $\mathcal{D}$-modules techniques and our previous results on invariant eigendistributions to prove this stronger regularity theorem.