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On the Multiplicities in the Restriction of a Supercuspidal Representation

The representation theory of reductive groups over p-adic fields can be split into two areas, namely the study of parabolically induced representations and the study of supercuspidal representations. Given a reductive group G defined over a p-adic field F, one can construct supercuspidal representations of any positive depth via the Adler-Yu construction. This construction uses what Yu called a G-datum. It was later proved by Kim-Fintzen that these constructions exhaust all positive depth supercuspidal representations for large enough p.

In this talk, we will be interested in the restriction of a positive depth supercuspidal of $G(F)$ to the subgroup $G_{der}(F)$, where G_{der} denotes the derived subgroup of G. The goal is to further explore a conjecture regarding multiplicity one established by Adler and Prasad. To understand such a restriction, we first define how to restrict a G-datum to G_{der}-data. We can then study how the supercuspidals arising from the various G_{der}-data produced appear in the restriction to $G_{der}(F)$ of the supercuspidal arising from the initial G-datum. The question of multiplicity one in this restriction then reduces to the study of certain depth zero supercuspidal representations.