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*Branching Rules for Principal Series Representations*

The restriction of a principal representation of unramified  $p$ -adic  $U(1,1)$  to a maximal compact subgroup decomposes as a multiplicity-free direct sum of irreducible representations, and we show moreover that when restricted to a small enough neighbourhood, such a representation decomposes as a direct sum of irreducible representations constructed from nilpotent elements of the Lie algebra. This mirrors the supercuspidal case, which I completed in earlier work. In this talk, we will explore how to study such branching rules: from understanding the decomposition at the level of maximal compact subgroups to uncovering finer structure at smaller scales. Along the way, we will present an explicit description of the decomposition and highlight tools and ideas that make this analysis possible.