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Simple cuspidals for classical groups and the local Langlands correspondence

Abstract : Let p be a prime number, and F a finite extension of \mathbf{Q}_p . Let G be a split classical group Sp_{2n} , SO_{2n+1} or SO_{2n} over F , and let π be simple (smooth, irreducible, complex) cuspidal representation of $G(F)$ (the simple cuspidals à la Gross-Reeder are indeed simple to construct). By the local Langlands correspondence proved by Arthur, π has a corresponding Langlands parameter, a morphism φ of the Weil-Deligne group of F into the dual group $G^\wedge = SO_{2n+1}(\mathbf{C})$, $Sp_{2n}(\mathbf{C})$, $SO_{2n}(\mathbf{C})$ respectively. Seeing φ as a self-dual representation of the required dimension N , the question arises to describe the smooth irreducible representation Π of $GL_N(F)$ corresponding to φ . It turns out that the answer, obtained in work of Adrian, Kaplan, Oi and I, is quite different in the two cases p odd or p even. In the talk I shall concentrate on the case where $G = Sp_{2n}$.