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On the central value of Rankin L-functions for self-dual algebraic representations of linear groups over totally real fields

Abstract : Let  $F$  be a totally real number field and  $\pi, \rho$  self-dual, cuspidal representations, respectively, of  $GL(m)$  and  $GL(n)$  over  $F$ . We assume  $m$  odd,  $n$  even. The Rankin L-function  $L(s, \pi \times \rho)$  has a critical value, according to Deligne's definition, at  $s = 1/2$ . If we assume  $\pi, \rho$  algebraic regular, they can be conjugated by automorphisms of the complex numbers  $\mathbb{C}$ . According to Deligne's conjecture, the existence of a zero at  $s = 1/2$  is then invariant by these automorphisms. We prove this by a simple argument relying on Zucker's 'conjecture'. In most cases the result follows from calculations of periods (resp. intertwining operators) by Grobner and Raghuram (resp. Harder and Raghuram). However a 'singular' case is new. This is common work with Arno Kret.