

**ON REPRESENTATION THEORY OF $GL(n)$ OVER
 p -ADIC DIVISION ALGEBRA AND UNITARITY
IN JACQUET-LANGLANDS CORRESPONDENCE**

MARKO TADIĆ

ABSTRACT. Let F be a p -adic field of characteristic 0, and let A be an F -central division algebra of dimension d_A over F . In the paper we first develop the representation theory of $GL(m, A)$, assuming that holds the conjecture which claims that unitary parabolic induction is irreducible for $GL(m, A)$'s. Among others, we obtain the formula for characters of irreducible unitary representations of $GL(m, A)$ in terms of standard characters. Then we study the Jacquet-Langlands correspondence on the level of Grothendieck groups of $GL(pd_A, F)$ and $GL(p, A)$. Using the above character formula, we get explicit formulas for the Jacquet-Langlands correspondence of irreducible unitary representations of $GL(n, F)$ (assuming the conjecture to hold). As a consequence, we get that Jacquet-Langlands correspondence sends irreducible unitary representations of $GL(n, F)$ either to zero, or to the irreducible unitary representations, up to a sign.

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