1. *On Certain Square Integrable Irreducible Unitary Representations of Some $\mathfrak{P}$-Adic Linear Groups*

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0. **Introduction.** Let P be a $\mathfrak{P}$-adic number field. Denote by $\mathcal{O}$, $\mathfrak{P}$, and $\mathcal{O}^*$ the ring of integers, the maximal ideal of $\mathcal{O}$ and the unit group respectively. Mautner proved that the $PGL(2, P)$ has square integrable irreducible unitary representations induced by certain irreducible representations of some maximal compact subgroup of $PGL(2, P)$.

In this note, we shall consider the subgroup G of $GL(n, P)$ formed by the matrices with determinant in $\mathcal{O}^*$. Using the theory of induced representations of finite groups, we first construct irreducible unitary representations of $K=GL(n, \mathcal{O})$ parametrized by certain characters of the unit group of the unramified extension of P of degree n, which are monomial if n is odd. Modifying the method of Mautner, we shall show that the representations of G induced by above representations of K are square integrable and irreducible. For simplicity we assume that n is odd. But we can construct similar representation when n is even, though the result becomes somewhat complicated. Modifying Harish-Chandra's character formula for square integrable representations of real semi-simple Lie groups, we can get a character formula for our representations. Similar results can be obtained for $SL(n, P)$.

The author could get copies of J.A. Shalika's lectures in seminar on representations of Lie groups held at Princeton in 1966.* The author's work is independent of Shalika's results. But their method and results overlap each other to a certain extent. Detailed proofs will be published elsewhere.

1. For any integer n we denote by $P^{(n)}$ the unramified extension of P of degree n. Let $\mathcal{O}^{(n)}$ be the ring of integral elements of $P^{(n)}$ and $\mathcal{P}^{(n)}$ be the maximal ideal of $\mathcal{O}^{(n)}$. Let π be a generator of $\mathcal{P}$ in $\mathcal{O}$. Then π is a generator of $\mathcal{P}^{(n)}$ in $\mathcal{O}^{(n)}$. We denote by $\mathrm{Gal}(P_n/P)$ the Galois group of $P^{(n)}$ with respect to P. $\mathrm{Gal}(P_n/P)$ is a cyclic group of order n. Let σ be a generator of this group. Let J be the following matrix in $M(n, \mathcal{O}^{(n)})$:

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*) J. A. Shalika: Representations of the two by two unimodular groups over local fields. I, II.