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TOPOLOGY OF UNITARY DUAL OF NONARCHIMEDEAN GL(n)

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Introduction. Let G be a locally compact group. The set of all equivalence classes of irreducible unitary representations of G is denoted by $\hat{G}$. The set $\hat{G}$ is called the unitary dual of G and it carries a natural topology (see [5]).

Let F be a local nonarchimedean field. In this paper we consider properties of the representation theory of GL(n, F)-groups related to the topology of the unitary dual of GL(n, F). The main results of this paper are: classification of all isolated points modulo center in GL(n, F)$\hat{}$, description of composition factor of ends of complementary series representations and description of GL(n, F)$\hat{}$ as (abstract) topological space.

For reductive groups over local fields the unitary dual as topological space has been determined, as far as this author knows, for the following groups: SL(2, $\mathbb{C}$) by J. M. G. Fell in [6] (1961), SL(2, $\mathbb{R}$) by D. Miličić in [11] (1971), universal covering group of SL(2, $\mathbb{R}$) by H. Kraljević and D. Miličić in [10] (1972), universal covering group of SU(n, 1) by H. Kraljević in [9] (1973) and SL(2, k) where k is non-archimedean by this author in [17] (1982).

The unitary dual GL(n, F)$\hat{}$ as the set is parametrized in [19]. The results we need in our study of the topology of the unitary dual are contained in [5], [12] and [18].

Now we give a more detailed description of the content of this paper.

In the first section we collect the basic definitions and results related to the topology of the unitary duals of reductive groups over local nonarchimedean fields. In this section we introduce the notion of an isolated point in $\hat{G}$ modulo center (or modulo unramified characters). Let $U^u(G)$ be the group of all unitary unramified characters of G. For $\pi \in \hat{G}$ the set $U^u(G)\pi \subseteq \hat{G}$ is always closed and connected. By this, each open and closed subset of G containing π contains also $U^u(G)\pi$. Therefore we define $\pi \in \hat{G}$ to be isolated modulo center if $U^u(G)\pi$ is an open subset of $\hat{G}$. If G has no nontrivial split toruses in the center (for example if G is semisimple), then this notion is equal to the standard notion of isolated point (or isolated representation) in $\hat{G}$. One may consult [24] for more discussion of this notion.

The second section deals with the basic topological properties of GL(n, F) .

In the third section we introduce the notation related to the nonunitary dual of GL(n, F) and recall of the main results of Bernstein and Zelevinsky from [3] and [22]. We recall of Langlands and Zelevinsky classifications.

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