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Weil representations of symplectic and unitary groups over finite local rings

Let \mathcal{O} be the ring of integers of a local field, with maximal ideal \mathfrak{P} . Write $\mathrm{Sp}_{2n}(R)$ for the symplectic group of rank $2n$ over the quotient ring $R = \mathcal{O}/\mathfrak{P}^l$. The Weil representation W of $\mathrm{Sp}_{2n}(R)$ is defined, its irreducible constituents are determined, their Clifford theory is elucidated, and their character fields and Schur indices are computed. A character formula for the restriction of W to the unitary group $\mathrm{U}_n(\bar{R})$, \bar{R} a quadratic extension of R , is given.