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Covers of reductive groups and functoriality

Abstract : When studying problems arising from Langlands' functoriality principle, one often encounters groups that are extensions of complex reductive groups by Galois groups, but that do not necessarily satisfy all properties to be L-groups of reductive groups. We will show, in the case of a local base field  $F$ , that such group can be understood as L-groups of covers of reductive groups. This generalizes to the case of arbitrary local fields work of Adams–Vogan for real groups.

These covers, for a fixed connected reductive group  $G$ , can be understood as arising from a certain “universal” cover of the topological group  $G(F)$  by a certain “fundamental” group  $\tilde{\pi}_1(G)$ .

We will present two concrete applications of this, one that gives a characterization of the local Langlands correspondence for supercuspidal L-parameters when  $p$  is sufficiently large, and one to the construction of transfer factors in the theory of endoscopy.