Symmetry of Arthur Parameters under Aubert Involution

For a generic irreducible representation $\pi$ of the odd orthogonal group $SO(2n+1, F)$ over a $p$-adic field $F$, we compute the Aubert involution $\hat{\pi}$ and the corresponding $L$-parameter. We show that, among generic representations, only tempered representations are base points attached to $A$-parameters and prove that in this case the $A$-parameters of $\pi$ and $\hat{\pi}$ are symmetric. In addition, we consider $A$-parameters $\psi$ of $SO(2n+1, F)$ corresponding to certain nontempered representations and prove that $\psi$ and $\hat{\psi}$ are symmetric.

Keywords: Arthur parameters, Aubert involution, odd orthogonal groups over $p$-adic fields.

MSC: 22E50, 11F70