Let $k_0$ be a field of characteristic 0, $k$ its algebraic closure, $G$ a connected reductive group defined over $k$. Let $H \subset G$ be a spherical subgroup. We assume that $k_0$ is a large field, for example, $k_0$ is either the field $\mathbb{R}$ of real numbers or a $p$-adic field. Let $G_0$ be a quasi-split $k_0$-form of $G$. We show that if $H$ has self-normalizing normalizer, and $\Gamma = \text{Gal}(k/k_0)$ preserves the combinatorial invariants of $G/H$, then $H$ is conjugate to a subgroup defined over $k_0$, and hence, the $G$-variety $G/H$ admits a $G_0$-equivariant $k_0$-form. In the case when $G_0$ is not assumed to be quasi-split, we give a necessary and sufficient Galois-cohomological condition for the existence of a $G_0$-equivariant $k_0$-form of $G/H$.

**Keywords:** Equivariant form, inner form, algebraic group, spherical homogeneous space.

**MSC:** 20G15, 12G05, 14M17, 14G27, 14M27.