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## Irreducible Characters and Semisimple Coadjoint Orbits

When $G_{\mathbb{R}}$ is a real, linear algebraic group, the orbit method predicts that nearly all of the unitary dual of $G_{\mathbb{R}}$ consists of representations naturally associated to orbital parameters $(\mathcal{O}, \Gamma)$. If $G_{\mathbb{R}}$ is a real, reductive group and $\mathcal{O}$ is a semisimple coadjoint orbit, the corresponding unitary representation $\pi(\mathcal{O}, \Gamma)$ may be constructed utilizing Vogan and Zuckerman's cohomological induction together with Mackey's real parabolic induction. In this article, we give a geometric character formula for such representations $\pi(\mathcal{O}, \Gamma)$. Special cases of this formula were previously obtained by Harish-Chandra and Kirillov when $G_{\mathbb{R}}$ is compact and by Rossmann and Duflo when $\pi(\mathcal{O}, \Gamma)$ is tempered.

**Keywords**: Semisimple orbit, coadjoint orbit, orbit method, Kirillov's character formula, cohomological induction, parabolic induction, reductive group.

**MSC**: 22E46.