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On the Dual Topology of a Class of Cartan Motion Groups

Let (G, K) be a compact Riemannian symmetric pair, and let G_0 be the associated Cartan motion group. Under some assumptions on the pair (G, K), we give a precise description of the set $(\widehat{G_0})_{\mathrm{gen}}$ of all equivalence classes of generic irreducible unitary representations of G_0. We also determine the topology of the space $(\mathfrak{g}_0^{\ddagger}/G_0)_{gen}$ of generic admissible coadjoint orbits of G_0 and we show that the bijection between $(\widehat{G_0})_{\mathrm{gen}}$ and $(\mathfrak{g}_0^{\ddagger}/G_0)_{\mathrm{gen}}$ is a homeomorphism. Furthermore, in the case where the pair (G, K) has rank one, we prove that the unitary dual $\widehat{G_0}$ is homeomorphic to the space $\mathfrak{g}_0^{\ddagger}/G_0$ of all admissible coadjoint orbits of G_0.

Keywords: Symmetric space, motion group, induced representation, coadjoint
orbit.

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