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Isometric Actions of Quaternionic Symplectic Groups

Denote by $Sp(k,l)$ the quaternionic symplectic group of signature (k,l). We study the deformation rigidity of the embedding $Sp(k,l) \times Sp(1) \hookrightarrow H$, where H is either $Sp(k+1,l)$ or $Sp(k,l+1)$, this is done by studying a natural non-associative algebra $\mathfrak{m}$ coming from the affine structure of $Sp(1)\backslash H$. We compute the automorphism group of $\mathfrak{m}$ and as a consecuence of this, we are able to compute the isometry group of $Sp(1)\backslash H$ at least up to connected components. Using these results, we obtain a uniqueness result on the structure of $Sp(1)\backslash H$ together with an isometric left $Sp(k,l)$-action and classify its finite volume quotients up to finite coverings. Finally, we classify arbitrary isometric actions of $Sp(k,l)$ into connected, complete, analytic, pseudo-Riemannian manifolds of dimension bounded by $\dim(Sp(1)\backslash H)$ that admit a dense orbit.

Keywords: Pseudo-Riemannian manifolds, rigidity results, non-compact quaternionic symplectic groups.

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