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Pseudo-Ricci–Bourguignon solitons in the complex hyperbolic two-plane Grassmannians

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Abstract. By using the notion of pseudo-anti-commuting Ricci tensor, we have investigated a Hopf real hypersurface in the complex hyperbolic two-plane Grassmannian $G_2^*(\mathbb{C}^{m+2})$ which admits a pseudo-Ricci–Bourguignon soliton. In addition to this, we have proved that a non-trivial gradient pseudo-Ricci–Bourguignon soliton $(M, Df, \eta, \Omega, \theta, \gamma, g)$ on real hypersurfaces with isometric Reeb flow in the complex hyperbolic two-plane Grassmannian $G_2^*(\mathbb{C}^{m+2})$ does not exist. In the class of contact hypersurfaces in $G_2^*(\mathbb{C}^{m+2})$ except a tube with certain radius $r = \coth^{-1}(\sqrt{3})$ over the totally geodesic and totally real quaternionic hyperbolic space $\mathbb{H}H^n$ in $G_2^*(\mathbb{C}^{m+2})$, $m = 2n$, it has been also proved that there does not exist a non-trivial gradient pseudo-Ricci–Bourguignon soliton in $G_2^*(\mathbb{C}^{m+2})$.

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