

Parallel real hypersurfaces in $\mathbb{S}^2 \times \mathbb{S}^2$ and $\mathbb{H}^2 \times \mathbb{H}^2$ with respect to the k -generalized Tanaka–Webster connection

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Abstract. In this paper, we first characterize real hypersurfaces of both the Kähler surfaces $\mathbb{S}^2 \times \mathbb{S}^2$ and $\mathbb{H}^2 \times \mathbb{H}^2$ such that their shape operators have identical covariant derivatives with respect to the Levi-Civita connection and the k -generalized Tanaka–Webster connection for a nonzero $k \in \mathbb{R}$. Then, amongst others, we classify all real hypersurfaces of both $\mathbb{S}^2 \times \mathbb{S}^2$ and $\mathbb{H}^2 \times \mathbb{H}^2$ whose shape operators are parallel with respect to the k -generalized Tanaka–Webster connection.

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