

**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**

By ZEJUN HU (Zhengzhou) and XIAOGE LU (Zhengzhou)

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.

ZEJUN HU & XIAOGE LU
SCHOOL OF MATHEMATICS
AND STATISTICS
ZHENGZHOU UNIVERSITY
ZHENGZHOU 450001
P. R. CHINA

Mathematics Subject Classification: 53B25, 53B35, 53C42.

Key words and phrases: parallel real hypersurface, $\mathbb{S}^2 \times \mathbb{S}^2$ and $\mathbb{H}^2 \times \mathbb{H}^2$, shape operator, Levi-Civita connection, k -generalized Tanaka–Webster connection.