

ON $Sp(2)$ AND $Sp(2) \cdot Sp(1)$ -STRUCTURES IN 8-DIMENSIONAL VECTOR BUNDLES

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Abstract

Let ξ be an oriented 8-dimensional vector bundle. We prove that the structure group $SO(8)$ of ξ can be reduced to $Sp(2)$ or $Sp(2) \cdot Sp(1)$ if and only if the vector bundle associated to ξ via a certain outer automorphism of the group $Spin(8)$ has 3 linearly independent sections or contains a 3-dimensional subbundle. Necessary and sufficient conditions for the existence of an $Sp(2)$ -structure in ξ over a closed connected spin manifold of dimension 8 are also given in terms of characteristic classes.

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Keywords. Cayley numbers, principle of triality, vector bundle, reduction of the structure group, classifying spaces, characteristic classes.

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