

CONSTRUCTION OF WARPED-LIKE PRODUCT MANIFOLDS WITH $SPIN(7)$ HOLONOMY

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E. Cartan gave the holonomy group definition and the classification of irreducible, simply-connected and symmetric manifolds in 1925. In 1955, Marcel Berger gave the holonomy group classification list of irreducible, simply-connected and non-symmetric manifolds [6]. Berger's holonomy group list called the Berger list is short and includes two exceptional cases, G_2 holonomy on a 7-dimensional manifold and $Spin(7)$ holonomy on an 8-manifold. These holonomy groups are called the exceptional holonomy groups and manifolds with these holonomy groups are called the exceptional holonomy manifolds. When M. Berger gave the possible holonomy groups list, he did not know whether G_2 and $Spin(7)$ holonomy groups manifolds exist or not. In 1987, the existence question of exceptional holonomy manifolds was answered [1]. R. Bryant and S. Salomon gave the first complete example of $Spin(7)$ holonomy manifold which was the total space of the spin bundle over the 4-sphere [2]. Dominic Joyce gave the first compact examples of exceptional holonomy manifolds in 1996 and wrote the methods of construction of manifolds as a book in [3]. He constructed manifold examples by resolving the singularities of the orbifold T^8/Γ for some groups Γ .

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In this work, we try to define the warped-like product manifold structure with $Spin(7)$ holonomy group. We consider the manifold M with warped-like product, we give the some geometric and topological properties of M . Finally we prove a main Theorem related to the warped-like product manifolds and present an explicit example of warped-like product $Spin(7)$ manifold which is related to the example given by [8].

References

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