I will talk about a new concept called octonionic-Kähler structure. Let \((M, g)\) be a smooth Riemannian manifold. Suppose \(V\) is a 7-dimensional subbundle of the vector bundle \(\text{End}(TM)\) such that a fiber of \(V\) through the point is spanned by almost complex structures \(J_\lambda\) at that point.

I impose two constraints on \(V\). First, there exists a non-associative product of almost complex structures. It corresponds to the octonionic product. Secondly, the following formula holds:

\[
\nabla_g J_\lambda \omega^{\mu}_{\lambda} J_\mu,
\]

where \(\omega \in \mathfrak{g}_2 \otimes \Omega^1(M)\). The \(\mathfrak{g}_2\) algebra arises naturally, since \(G_2 = \text{Aut}_\mathbb{R}(\mathbb{O})\).

The defined bundle \(V\) over \(M\) is called an octonionic-Kähler structure on manifold \(M\) or I say that \(M\) is an octonionic-Kähler manifold. Then I will introduce the following theorem.

**Theorem.** Let \(M\) be a Riemannian 8-manifold with holonomy group contained in \(\text{Spin}(7)\); then \(M\) is the octonionic-Kähler manifold.

**REFERENCES**


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