Institut für Geometrie und Topologie

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On the Obata connection of Joyce's hyper-complex manifolds

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Raum 7.530

Abstract: Joyce's hypercomplex manifolds, introduced by D. Joyce in 1992, form one of the largest known classes of compact hypercomplex manifolds. Despite their structure as compact Lie groups, the behavior of the holonomy of their Obata connection has remained a compelling open question. In 2011, Soldatenkov showed that in quaternionic dimension 2-specifically on SU(3)- the holonomy of the Obata connection is full, i.e., equal to GL(2, H), and conjectured that a similar phenomenon occurs for all Joyce manifolds. In this talk, I will present a counterexample to this conjecture in quaternionic dimension 3. This example motivated a broader investigation, and we were able to prove that, except for a specific family of Joyce manifolds and the Hopf surface (which is Obata-flat), the Obata holonomy of any Joyce hypercomplex manifold is reducible.

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