Gorodkov, D. A.

A minimal triangulation of the quaternionic projective plane. (English) Zbl 1369.57027

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The problem of finding minimal triangulations of manifolds with respect to the number of vertices is a classical problem in combinatorial topology. The solution of this problem is known for a fairly small set of manifolds. The difficulty of the problem increases especially with the growth of the dimension. The manifolds $\mathbb{RP}^2$, $\mathbb{CP}^2$, $\mathbb{HP}^2$ are some of the fundamental objects in geometry and topology in dimension 2, 4 and 8, respectively. Minimal triangulations of $\mathbb{RP}^2$ and $\mathbb{CP}^2$ are known, but the problem remained open for $\mathbb{HP}^2$. In [Math. Ann. 294, No. 1, 167–193 (1992; Zbl 0734.57017)], *U. Brehm* and *W. Kühnel* constructed a minimal triangulation of an 8-dimensional manifold and conjectured that the manifold is PL-homeomorphic to $\mathbb{HP}^2$. In this article, the author proves this conjecture.

Reviewer: Biplab Basak (Ithaca)

MSC:

57R05 Triangulating
57R20 Characteristic classes and numbers in differential topology
05E45 Combinatorial aspects of simplicial complexes

Keywords:

quaternionic projective plane; triangulation; Morse function

Software:

GAP

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