

A 15-vertex triangulation of the quaternionic projective plane

Denis Gorodkov

Steklov Mathematical Institute of Russian Academy of Sciences, Moscow, RUSSIA

[denis.gorod@gmail.com]

In 1992, Brehm and Kühnel constructed a 8-dimensional simplicial complex M_{15}^8 with 15 vertices as a candidate to be a minimal triangulation of the quaternionic projective plane. They managed to prove that it is a manifold “like a projective plane” in the sense of Eells and Kuiper, ie a manifold that admits a Morse function with exactly 3 critical points. However, it was not known until now if this complex is PL homeomorphic (or at least homeomorphic) to $\mathbb{H}P^2$. This problem was reduced to the computation of the first rational Pontryagin class of this combinatorial manifold. Realizing an algorithm due to Gaifullin, we compute the first Pontryagin class of M_{15}^8 . As a result, we obtain that it is indeed a minimal triangulation of $\mathbb{H}P^2$.
