FLOYD'S MANIFOLD IS A CONJUGATION SPACE

WOLFGANG PITSCH AND JÉRÔME SCHERER

Abstract. Floyd showed in 1973 that there exist only two non-trivial cobordism classes that contain manifolds with three cells, and that they lie in dimensions 10 and 5. We prove that there is an action of the cyclic group $\mathbf{C}_2$ on the 10-dimensional Floyd manifold which turns it into a conjugation manifold in the sense of Hausmann, Holm, and Puppe. The submanifold of fixed points is the 5-dimensional Floyd manifold, whose cohomology is isomorphic to that of the large one, scaled down by dividing the cohomological degree by a factor two.

This concrete example allows us to introduce the original definition of conjugation space and a genuine equivariant stable characterization obtained in joint work with Nicolas Ricka, to apply equivariant surgery techniques thanks to work of Lück and Uribe, as well as a splitting result for $\mathbf{C}_2$-equivariant spaces by C. May.

Universitat Autònoma de Barcelona, Departament de Matemàtiques, E-08193 Bellaterra, Spain

Email address: pitsch@mat.uab.es

EPFL, Institute of Mathematics, Station 8, CH-1015 Lausanne, Switzerland

Email address: jerome.scherer@epfl.ch

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