ON THE FUNDAMENTAL DOMAIN OF TETRAHEDRAL SPHERICAL SPACE FORMS

ANA PAULA TREMURA GALVES, MAURO FLÁVIO SPREAFICO AND
OZIRIDE MANZOLI NETO

The topological spherical space forms problem is the study of fixed-point free actions of finite groups on spheres. Equivalently, it is the study of space forms.

The earliest examples of space forms are the Clifford-Klein manifolds. A Clifford-Klein manifold is a complete Riemannian manifold with constant sectional curvature equal to +1. They are of the form S^{4n-1}/G where G is a finite group acting freely and orthogonally on the sphere $4n-1$-dimensional (S^{4n-1}). The classification of Clifford-Klein manifolds is thus a completely algebraic question in group representation theory. A complete solution was given by J. Wolf [3].

We denote by P_{24} the binary tetrahedral group of order 24. This is the group with three generators and presentation

$$P_{24} = \langle x, y, z \mid x^2 = (xy)^2 = y^2, zxz^{-1} = y, zyz^{-1} = xy, xyx^{-1} = y^{-1}, z^3 = x^4 = 1 \rangle$$

that acts freely on the odd dimension spheres.

The main purpose of this work is to describe a fundamental domain of the spherical space forms which fundamental group is the binary tetrahedral group, that we call *tetrahedral spherical space forms* and we denote by $\mathcal{P} = S^{4n-1}/P_{24}$.

References

[1] Melo, T.; Neto, O.M.; Spreafico, M.F. *Cellular decomposition of quaternionic spherical space forms*. Geommetriae Dedicata, v.157, p.10.1007/s10711-012-9714-4, **2012**.

[2] Tomoda, S.; Zvengrowski, P. *Remarks on the cohomology of finite fundamental groups of 3-manifolds*. Geometry and Topology Monographics, v.14, p.519-556, **2008**.

[3] Wolf, J.A. *Spaces of constant curvature*. McGraw-Hill Inc., **1967**.

[4] Zimmermann, B. *On the classification of finite groups acting on homology 3-spheres*. Pacific Journal of Mathematics, v.217, n.2, p.387-395, **2004**.

(Ana Paula Tremura Galves) ICMC-USP - SUPPORTED BY CNPQ
E-mail address: `runajo@icmc.usp.br`

(Mauro Flávio Spreafico) ICMC-USP
E-mail address: `mauros@icmc.usp.br`

(Oziride Manzoli Neto) ICMC-USP
E-mail address: `ozimneto@icmc.usp.br`