

# VOLUMES OF POLYHEDRA WITH SYMMETRIES

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We overview the volume calculations for polyhedra in Euclidean, spherical and hyperbolic spaces. We prove the Sforza's formula for the volume of an arbitrary compact tetrahedron in  $H^3$  and  $S^3$  [1]. We present some results, which provide a solution for Seidel problem on the volume of non-Euclidean tetrahedron. We consider a truncated icosahedron (so called fullerene  $C_{60}$  or soccer ball) which is a semi-regular polyhedron and one of 13 Archimedean solids. We solve an isoperimetrical problem for Euclidean  $C_{60}$  and find some relations between lengths and angles of  $C_{60}$  in  $H^3$ .

## REFERENCES

- [1] N. Abrosimov, A. Mednykh, "Volumes of polytopes in constant curvature spaces", *Fields Institute Communications*, Vol. 70, 1–26 (2014). arXiv:1302.4919 [math.MG]

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