

The isodiametric problem in spaces of constant curvature and its stability

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The isodiametric inequality in the Euclidean space was proved by Bieberbach and Urysohn; namely, balls maximize the volume of a convex body of given diameter. We verify the analogous statement in the spherical and hyperbolic spaces. In addition, we prove a stability version of this statement in each of the three types of spaces of constant curvature. The reverse isodiametric problem is looking for the convex body of constant width of a given diameter with the minimal volume. Blaschke and Lebesgue proved, that on the plane, the Reuleaux triangle has the minimal area among these bodies, however this problem is still open in higher dimensions. We will see the extension of this result in planes of constant curvature, where we also prove a stability version of the theorem. This is a joint work with Károly J. Böröczky.