

A cap covering theorem

Alexandr Polyanskii

MIPT

`alexander.polyanskii@yandex.ru`

A *cap* of spherical radius α on a unit d -sphere S is the set of points within spherical distance α from a given point on the sphere. Let \mathcal{F} be a finite set of caps lying on S . We prove that if no hyperplane through the center of S divides \mathcal{F} into two non-empty subsets without intersecting any cap in \mathcal{F} , then there is a cap of radius equal to the sum of radii of all caps in \mathcal{F} covering all caps of \mathcal{F} provided that the sum of radii is less $\pi/2$.

This is the spherical analog of the so-called circle covering theorem by Goodman and Goodman and the strengthening of Fejes Tóth's zone conjecture proved by Jiang and the author.