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A cap covering theorem

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 $\pi/2$.