
VIKTOR VIGH, University of Szeged
On random spherical disc-polygons

In 2017 Bárány, Hug, Reitzner and Schneider studied random spherical polytopes that are the spherical convex hull of n independent, uniform random points chosen from a half-sphere. They proved that expectation of the number of facets tends to a constant c_d that depends only on the dimension (as $n \rightarrow \infty$). In 2020 Fodor showed that if we choose independent uniform random points from a unit ball, then the expected number of the facets of the generated uniform random ball-polytope also tends to the constants c_d in any dimension. In this talk we connect these two results in the case when $d = 2$, we study random spherical disc-polygons in a spherical cap of appropriate size, and show that expectation of the number of the edges tends to $c_2 = \pi^2/2$. We also extend the result to a more general case, where we choose the random points from a spherical convex disc with C^2 smooth boundary.

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