20th Workshop on Stochastic Geometry, Stereology and Image Analysis

2–7 June, 2019, Sandbjerg Estate, Denmark

Abstract

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# Persistent Betti numbers of random Čech complexes

*Joint with Ulrich Bauer*

We study the persistent homology of random Čech complexes. Generalizing a method of Penrose for studying random geometric graphs, we first describe an appropriate theoretical framework in which we can state and address our main questions. Then we define the $k$th *persistent* Betti number of a random Čech complex and determine its asymptotic order in the subcritical regime. This extends a result of Kahle on the asymptotic order of the ordinary $k$th Betti number of such complexes to the persistent setting.