

# HIGHER ORDER HOMOLOGICAL PERCOLATION ON THE TORUS

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In percolation theory usually one asks questions about the appearance of large components with given properties in a random space. In [1] Duncan, Kahl and Schweinhart considered a so called plaquette percolation - very similar to Bernoulli percolation - on the torus and proved results on the critical values of different properties of the image of the homology group induced by the natural inclusion. They proved that some critical values in the middle dimension are  $1/2$  but for other dimensions the concrete values are unknown. I will talk about about this percolation model, present some of my approaches to the problem and simulation results.

- [1] DUNCAN, P., KAHLE, M., AND SCHWEINHART, B., Homological percolation on a torus: plaquettes and permutohedra, *arXiv preprint arXiv:2011.11903*. (2020).