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Thick Points of Higher-Dimensional Gaussian Free Fields

Thick points of continuum Gaussian Free Fields (GFF) are analogs of extrema (or near extrema) of discrete GFFs, which are important objects for characterizing the "landscape" of GFFs. The geometry of the set of thick points, e.g., the Hausdorff dimension, of the 2D continuum GFF has been studied by Hu-Miller-Peres (2010). More generally, similar results are found to hold for general log-correlated Gaussian fields. In this talk, we will explain how to extend the study of thick points to continuum GFFs in higher dimensions in which case the Gaussian fields will be polynomially correlated. In particular, we will introduce a recent result on the Hausdorff dimension of the sets of thick points of GFFs in \mathbb{R}^d for any $d > 2$.