

Ekström-Persson conjecture regarding random covering sets

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Résumé

We consider the Hausdorff dimension of random covering sets generated by balls and general measures in Euclidean spaces. We prove, for a certain parameter range, a conjecture by Ekström and Persson concerning the exact value of the dimension in the special case of radii $(n^{-\alpha})_{n=1}^{\infty}$. For generating balls with an arbitrary sequence of radii, we find sharp bounds for the dimension and show that the natural extension of the Ekström-Persson conjecture is not true in this case. Finally, we construct examples demonstrating that there does not exist a dimension formula involving only the lower and upper local dimensions of the measure and a critical parameter determined by the sequence of radii.