

Title: Density of Minkowski functionals of stationary random sets

Author: Bc. Filip Dohnálek

Department: Department of Probability and Mathematical Statistics

Supervisor: prof. RNDr. Jan Rataj, CSc., Mathematical Institute of Charles University

Abstract: In the presented work we can find the created theory of random closed excursion set generated by means of Gaussian real random field. We specialize in a real random field, which is defined on the regular stratified manifold. The text includes a determination of conditions for a random field and stratified manifold in which densities of the intrinsic volumes for excursion sets exist. Then subsequently attributes and relations of the excursion set are derived for the existence of densities of the intrinsic volumes. Finally, a simulated study is made where we compare theoretical and estimated values of densities. This is followed by a discussion on the results, which we compare to the Boolean model.

Keywords: Densities of the intrinsic volume, Excursion set, Manifold, Real random field