



Einladung zum Vortrag

12. Mai 2008

von

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Asymptotic Behavior of Random Fields and Statistical Applications

The approach to the calculation of the normal tissue complication probability (NTCP), introduced in Bulinski and Kherennikov (2005) and Bulinski (2008) in the framework of modelling the irradiated tissue (or organ) as a system of dependent functional subunits (FSUs), is further developed. We propose a stochastic model describing the collective effects of the cells behavior under irradiation and taking into account interplay of different factors. In particular, to specify the dependence structure of cells (or FSUs) we use various dependence concepts (see, e.g., Bulinski and Shashkin "Limit Theorems for Associated Random Fields and Related Systems" (World Scientific, 2007) and references therein). So we study the dependent arrays of multi-indexed random variables (in general with more than two values 0 and 1, thus going beyond the usual indication whether the unit is alive or killed) and consider the limiting behavior of random sums taken over finite subsets of specified bounded domains $V \subset R^d$, to incorporate geometric aspects of the system functioning and its monitoring. Here one can combine two distinct asymptotic procedures by imposing the growth conditions for such domains, as well as by scaling due to employing more and more dense grids for observations, see Bulinski (2008). Various stochastic models describing the irradiation of a tissue or an organ are discussed. The new models based on the concept of dependent behavior of cells (or functional subunits) are proposed. Moreover, the combination of the cluster and critical volume models is introduced. The asymptotic results are proved for such models involving the study of dependent random fields.

Termin: Dienstag, 24. Juni 2008, 17:15 Uhr

Ort: Universität Ulm, Helmholtzstr. 18, Raum He 220

Der Vortrag findet im Rahmen des Mathematischen Kolloquiums statt.
Interessenten sind herzlich eingeladen.

gez. E. Spodarev