Petunin, Yu. I.; **Semejko, N. G.**

The stochastic process of segments on the two-dimensional Euclidean sphere. I. (Russian)

Zbl 0665.60019

Teor. Veroyatn. Mat. Stat., Kiev 39, 107-113 (1988).

This work is the first part of research devoted to the construction and investigation of the properties of the cap random process U on the two- dimensional Euclidean sphere. There are many applied sciences such as astronomy, cosmology, selenography, cytology, virusology in which further progress is impossible without a mathematical model of the cap process on the sphere S^2. The process U is considered as a simple unordered marked point process (MPP) in the phase space $S^2 \times K$ where S^2 is the space of the cap centers (position points), $K = [0, A]$ is the space of cap diameters (marks) ($A << \pi$).

A simple MPP is represented by *J. E. Moyal*'s conception [see Acta Math. 108, 1-31 (1962; Zbl 0128.403)]. By using the methods of the theory of order statistics we introduce the concept of a simple unordered MPP with independent marking (PPIM) with the help of the theorem on renewal samples. From our point of view, the well-known *A. Prekopa* [see Ann. Univ. Sci. Budapest, Rolando Eötvös, Sect. Mat. 1, 153-170 (1958; Zbl 0089.340)] definition of the PPIM is insufficient for applications. We construct a point process of the position points by using a projection of MPP on the position space.

Reviewer: Y.I.Petunin

MSC:

60D05 Geometric probability and stochastic geometry
60G55 Point processes (e.g., Poisson, Cox, Hawkes processes)

Keywords:

point process with independent marking; cap random process; marked point process; order statistics