

**Mykola Portenko**

Institute of Mathematics, NAS of Ukraine

**Brownian motion in a Euclidean space with a  
membrane located on a given hyperplane**

The presentation is based on the results of investigations jointly carried out by Prof. Bohdan Kopytko and myself.

Abstract

Brownian motion in a Euclidean space with a membrane located on a given hyperplane and acting in a normal direction is constructed such that its so-called permeability coefficient can be given by an arbitrary Borel measurable function defined on that hyperplane and taking on its values from the interval  $[-1, +1]$ . In all the publications on the topic, that coefficient was supposed to be a continuous function. A certain limit theorem for the number of crossings through the membrane by a discrete approximation of the process constructed is proved. The limit distribution in that theorem can be curiously interpreted in the case of the membrane whose permeability coefficient coincides with the indicator of a measurable subset of the hyperplane.