

Probabilistic properties of Colombeau stochastic processes

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Colombeau stochastic processes (CSPs) are defined as Colombeau functions with values in the space of random variables with finite p th moments and with values in the space of real valued random variables endowed with almost sure convergence.

In [1], the notion of point values of CSPs in compactly supported generalized points is established and relying on this results we prove the measurability of the corresponding random variables with values in Colombeau algebra of compactly supported generalized constants endowed with the topology generated by sharp open balls. We have studied the structure of generalized correlation functions and representation of generalized characteristic functions of CSPs.

In [2], CSPs with independent values are defined and we give a characterization of such processes via their generalized correlation function in the classical Colombeau algebra of generalized numbers. Also, we have studied the properties of stationary CSPs, distinguishing between strict stationarity and weak stationarity.

References

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- [2] S. Gordić, M. Oberguggenberger, S. Pilipović and D. Seleši, Generalized stochastic processes in algebras of generalized functions: independence, stationarity and SPDEs, *J. Math. Anal. Appl.* (submitted).