

Cylindrical Wiener and Lévy processes

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Cylindrical Wiener processes are a well known and often used source of random noise for models in infinite dimensional spaces. In this talk we use the classical theory of cylindrical processes and cylindrical measures to define cylindrical Wiener processes and we relate this approach to the more common definitions in literature. Once we have seen the charm of this approach we define analogously cylindrical Lévy processes.

The cylindrical approach allows a straightforward definition of a stochastic integral in both cases of a cylindrical Wiener and cylindrical Lévy process without any geometric constraints on the underlying Banach space. We use this integral to develop a theory of cylindrical differential equations and demonstrate its practicalness by presenting some basic facts on the cylindrical Ornstein-Uhlenbeck process driven by a cylindrical Lévy process.