

A Malliavin-Skorohod calculus in L^0 and L^1 for additive Volterra-type processes

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Abstract: We develop a Malliavin-Skorohod type calculus for additive processes in the L^0 and L^1 settings, extending the probabilistic interpretation of the Malliavin-Skorohod operators to this context. We prove calculus rules and obtain a generalization of the Clark-Hausmann-Ocone formula for random variables in L^1 . Our theory is then applied to extend the stochastic integration with respect to volatility modulated Lévy-driven Volterra processes recently introduced in the literature. Our work yields to substantially weaker conditions that permit to cover integration with respect to e.g. Volterra processes driven by α -stable processes with $\alpha < 2$.

Key words: Additive processes, Lévy processes, Volterra processes, Malliavin-Skorohod calculus

References

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