Optimal approximation of stochastic integrals with respect to a homogeneous Poisson process

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We consider numerical approximation of stochastic integrals with respect to a homogeneous Poisson process. In the first part of the talk we focus on approximation in the asymptotic setting. We assume that an integrand is a function f from $\mathcal{C}^r([0,T])$. We show that the L^p-error of any approximation method, which uses n evaluations of f, cannot converge to zero faster than n^{-r}. In the second part of the talk we present the result in the worst-case setting. We discuss how the number of singularities of an integrand impacts the error. In the regular case we present an optimal algorithm which uses a nonadaptive information. In a case of a single singularity we show an adaptive algorithm that preserves the error known from the regular case.

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