

Complexity of Banach Space Valued and Parametric Stochastic Ito Integration

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We study the complexity of Banach space valued stochastic It^o integration. The considered Banach spaces are assumed to satisfy certain geometric properties. We investigate both, the Banach space valued Euler-Maruyama and the Milstein scheme and state complexity results for the definite and the indefinite integration problem.

The investigation of Banach space valued algorithms is motivated by the study of parametric problems. Such problems can be understood as particular cases of Banach space valued problems. Thus, next we consider parametric scalar stochastic It^o integration. For this purpose, we use the Banach space valued results and develop certain multilevel algorithms. We analyze these algorithms and also state complexity results for the parametric problem.