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倒向随机微分方程Sinc- θ 数值格式 (周涛)

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In this paper, we propose a new family of fully discrete Sinc- θ schemes for solving backward stochastic differential equations (BSDEs). More precisely, we consider the θ -schemes for the temporal discretizations and then adopt the Sinc approximations to approximate the associated conditional mathematical expectations. By appropriately selecting the parameters in the Sinc quadrature rule, our schemes are shown to be very efficient as no spatial interpolations are needed. Moreover, we perform rigorous stability analysis and error estimates, and this seems to be the first attempt at analyzing fully discrete schemes for BSDEs with a second-order convergence rate in time and exponential convergence in space. Several numerical experiments are presented to verify the theoretical results and to demonstrate the efficiency and accuracy of our schemes.

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