The authors propose a numerical scheme for the Monte-Carlo simulation of high-dimensional fully nonlinear parabolic PDEs. It follows the idea of the scheme of [A. Fahim et al., Ann. Appl. Probab. 21, No. 4, 1322–1364 (2011; Zbl 1230.65009)], but relaxes the monotonicity constraint in that work, which implies that the PDE has to be almost semilinear in high dimensions, by using discrete random variables with specified moments instead of normal random variables. Numerical examples are provided, showing the applicability of the method up to dimension 12.

**Keywords:** monotone scheme; least square regression; Monte Carlo methods; fully nonlinear PDEs; viscosity solutions

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