

**GENERAL THEOREMS FOR NUMERICAL APPROXIMATION OF
STOCHASTIC PROCESSES ON THE HILBERT SPACE $H_2([0, T], \mu, \mathbb{R}^d)^*$**

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Abstract. General theorems for the numerical approximation on the separable Hilbert space $H_2([0, T], \mu, \mathbb{R}^d)$ of cadlag, (\mathcal{F}_t) -adapted stochastic processes with μ -integrable second moments is presented for nonrandom intervals $[0, T]$ and positive measure μ . The use of the theorems is illustrated by the special case of systems of ordinary stochastic differential equations (SDEs) and their numerical approximation given by the drift-implicit Euler method under one-sided Lipschitz-type conditions.

Key words. stochastic-numerical approximation, stochastic Lax-Theorem, ordinary stochastic differential equations, numerical methods, drift-implicit Euler methods, balanced implicit methods.

AMS subject classifications. 65C20, 65C30, 65C50, 60H10, 37H10, 34F05.

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