Dissipative backward stochastic differential equations with locally Lipschitz nonlinearity.

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Abstract

In this paper we study a class of backward stochastic differential equations (BSDE) of the form

$$dY_t = -AY_t dt - f_0(t, Y_t) - f_1(t, Y_t, Z_t)dt + Z_t dW_t, \quad 0 \le t \le T; \quad Y_T = \xi$$

in an infinite dimensional Hilbert space H, where the unbounded operator A is sectorial and dissipative and f_0 and f_1 are suitable functions; in particular the nonlinearity $f_0(t, y)$ is dissipative and defined for y only taking values in a subspace of H. A typical example is provided by the so-called polynomial nonlinearities. Applications are given to stochastic partial differential equations and spin systems.