Stationary solutions of semilinear stochastic differential equations

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Consider a one-dimensional autonomous stochastic differential equation with additive noise

$$dX(t) = -\lambda X(t)dt + f(X(t))dt + dB(t),$$

where f is Lipschitz-continuous and the process B is supposed to have stationary increments.

The theorem of existence and uniqueness of the stationary solution is proven under rather weak assumptions about the process B. Examples of processes that satisfy the existence and uniqueness theorem's assumptions are given, one of them being fractional Brownian motion.

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