ASYMPTOTIC CORRESPONDENCE BETWEEN THE SOLUTIONS OF STOCHASTIC AND ORDINARY DIFFERENTIAL EQUATIONS

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We consider the following stochastics equations

$$\ddot{x} + (p(t) + q(t)\dot{W}(t))x = 0, \tag{1}$$

where $x \in \mathbb{R}^n$, $t \geqslant 0$, $p(t)$, $q(t)$ — are continuous functions, $W(t)$ — is a standard Wiener process. We understand the equation (1) as the following stochastics system

$$dx_1 = x_2 dt, \quad dx_2 = -p(t)x_1 dt - q(t)x_1 dW(t).$$

We introduce the notion a zero for these equations and we study the ostillation their solutions.

Theorem 1. *Let the following conditionare valid:*

1) $p(t) \leqslant 0$,
2) $\int_0^\infty q^2(t)dt < \infty$.

Then all the solutions of the equation (1) *are not ostillation on the positive half-line.*

Further we consider the special stochastics equations

$$\ddot{x} + (a^2 + q(t)\dot{W}(t))x = 0, \tag{2}$$

where $q(t)$ satisfy to the condition 2) of theorem 1.

Theorem 2. *All the the solutions of the equation* (2) *are ostillation on the positive half-line.*