The following equation is the dimensionless version of the Lagevin equation

$$V^*(t^* + dt^*) \; - \; V^*(t^*) \; = \; V^*(t^*)dt^* \; + \; \sqrt{dt^*} N_{t^*}^{t^*+dt^*}(0,1) \; . \qquad (1)$$

The dimensionless variables are the following, the dimensionless speed and time

$$V^* \; = \; \frac{\gamma^{1/2}}{\beta} \; ,$$

$$t^* \; = \; \gamma t \; ,$$

where $\gamma$ is the disipation coefficient and $\beta$ the diffusion coefficient