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STOCHASTIC RESONANCE AT DIFFUSION OVER A POTENTIAL BARRIER

The general problem of diffusive overcoming of a single-well potential barrier in the presence of a periodic time forcing is studied within the generalized Langevin approach. We found that the thermal diffusion over the barrier can be resonantly accelerated at some frequency of the periodic modulation that is inversely proportional to the mean first-passage time for the motion in the absence of the time-modulation. The resonant activation effect is rather insensitive to the correlation time of the random force term in the Langevin equation of motion.

Keywords: stochastic resonance, diffusion, potential barrier, Langevin equation, memory effects.