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Thermally activated escape rate for a Brownian particle in a double-well potential for all values of the dissipation WILLIAM COFFEY, Department of Electronic and Electrical Engineering, Trinity College, Dublin 2, Ireland, YURI KALMYKOV, MEPS, Université de Perpignan, 52 Avenue Paul Alduy, 66860 Perpignan Cedex, France, SERGEY TITOV, Institute of Radio Engineering and Electronics of the Russian Academy of Sciences, Fryazino, Moscow Region, 141190, Russian Federation — The translational Brownian motion in a (2-4) double-well potential is considered. The escape rate, the position correlation function and correlation time, and the generalized susceptibility are evaluated from the solution of the underlying Langevin equation by using the matrix continued fraction method. The escape rate and the correlation time are compared with the Kramers theory of the escape rate of a Brownian particle from a potential well as extended by Mel'nikov and Meshkov [J. Chem. Phys. **85**, 1018 (1986)]. It is shown that in the low temperature limit, the universal Mel'nikov and Meshkov expression for the escape rate provides a good estimate of both escape rate and inverse position correlation time for all values of the dissipation including the very low damping (VLD), very high damping (VHD), and turnover regimes. Moreover, for low barriers, where the Mel'nikov and Meshkov method is not applicable, analytic equations for the correlation time in the VLD and VHD limits are derived.

William Coffey
Department of Electronic and Electrical Engineering
Trinity College, Dublin 2, Ireland

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