Abstract Submitted
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Relaxation time of a Brownian rotator in a periodic potential with nonparabolic barriers[1] YURI KALMYKOV, Lab. Mathématiques et Physique des Systèmes, Université de Perpignan, 52, Avenue Paul Alduy, 66860 Perpignan Cedex, France, ROLAND BASTARDIS, PIERRE-MICHEL DÉJARDIN — The extension of the Kramers theory of the escape rate of a Brownian particle from a potential well to the entire range of damping proposed by Mel'nikov and Meshkov [J. Chem. Phys. **85**, 1018 (1986)] is applied to the rotational Brownian motion of fixed axis rotators in a Acos 2ϕ + Bcos 4ϕ potential exhibiting parabolic wells and nonparabolic barriers (A and B are parameters determining the shape of the barriers and ϕ is the angle of rotation). By applying an eigenvalue approach, we calculated the Kramers escape rate valid for all values of the dissipation including the very low damping, very high damping, and turnover regimes. Analytical results so obtained agree closely with the exact matrix continued fraction solution.

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