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Inertial effects in the fractional diffusion of a Brownian particle in a double-well potential WILLIAM COFFEY, Dept. Electronic and Electrical Engineering, Trinity College, Dublin 2, Ireland, YURI KALMYKOV, MEPS, Université de Perpignan, 52 Av. Paul Alduy, 66860 Perpignan Cedex, France, SERGEY TITOV, Inst. Radio Engineering and Electronics of the Russian Academy of Sciences, Vvedenskii Square 1, Fryazino, Moscow Region, 141190, Russia — The anomalous translational diffusion including inertial effects of nonlinear Brownian oscillators in a double well potential $V(x) = ax^2/2 + bx^4/4$ is considered. An exact solution of the fractional Klein-Kramers (Fokker-Planck) equation is obtained which allows one to calculate via matrix continued fractions the positional autocorrelation function and dynamic susceptibility describing the position response to a small external field. The result is a generalization of the solution for the normal Brownian motion in a double well potential to fractional dynamics (giving rise to anomalous diffusion).

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