

































Next, we use the expressions for  $\langle \tau^2 \rangle$  (see Eq. (30)), and derive  $\langle \tau^3 \rangle = -(\gamma/2)\tau_0^2\sqrt{\omega^2 - \omega_c^2} + \gamma^3\omega^2(\omega - \sqrt{\omega^2 - \omega_c^2})$ . Substituting these expressions together with with Eq. (33) into Eq. (32), we find that the effective diffusion coefficient can be written as

$$D_{eff} = \frac{k_B T}{\gamma} f(r) \quad (34)$$

where  $r = \frac{\omega_c}{\omega}$  and where  $f(r)$  is given by

$$f(r) \approx \frac{1}{\sqrt{1-r^2}} + \frac{2\sqrt{1-r^2}}{1+\sqrt{1-r^2}} \left[ r^2 + \frac{5}{4}r^4 \left( 1 + \frac{1}{1+\sqrt{1-r^2}} \right) \right]. \quad (35)$$

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