

this figure, during the half-cycle that the microheater voltage was stepped to zero, the transmitted power did not immediately reach minimum. As a result, the optical power in the resonator did not instantly reach maximum before the microheater voltage was stepped to high. This is the main reason that the speed of the nanoparticle (as determined from the slope of the particle distance versus time plot in Fig. 5(b)) was less than half of the speed when the resonator was always on resonance. However, other physical effects, such as the nonlinearity response of the resonator, could have also affected the dynamics of the nanoparticle. Figure 10(b) shows the spectrum of the resonator at both low and high powers. The asymmetry and broadening observed in the resonance spectrum at high optical powers is due to the nonlinearity effect induced by two-photon absorption and self-heating due to absorption of optical power in the resonator [30].

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