High, Size-Dependent Quality Factor in an Array of Graphene Mechanical Resonators

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Raman Spectroscopy

Figure S1 shows the Raman spectrum of one of the graphene resonators studied here. The shape of the 2D peak at ~ 2700 cm^{-1} confirms that the resonator is composed of graphene.
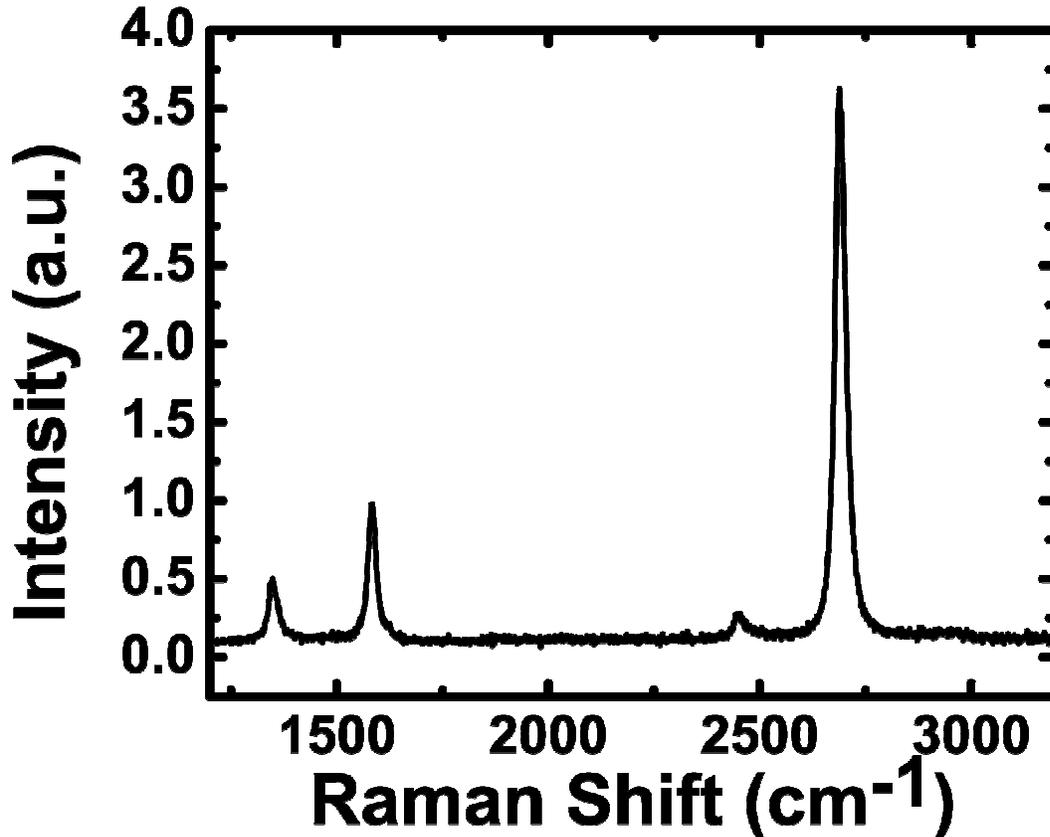

Figure S1. Raman spectrum of one of the circular graphene resonators studied in this work.

Dynamic Range of a Graphene Resonator

Figure S2 shows the frequency spectra as a function of various drive amplitudes for a graphene resonator 12 µm in diameter. The data was acquired with a network analyzer using an IF bandwidth of 1 kHz and a sweep time of 700 ms. The upper bound on the dynamic range is the nonlinearity seen at high drive powers, while the lower bound is the readout noise. The signal at the onset of nonlinearity (-20 dBm drive) divided by the rms noise gives a dynamic range of ~ 40 dB.
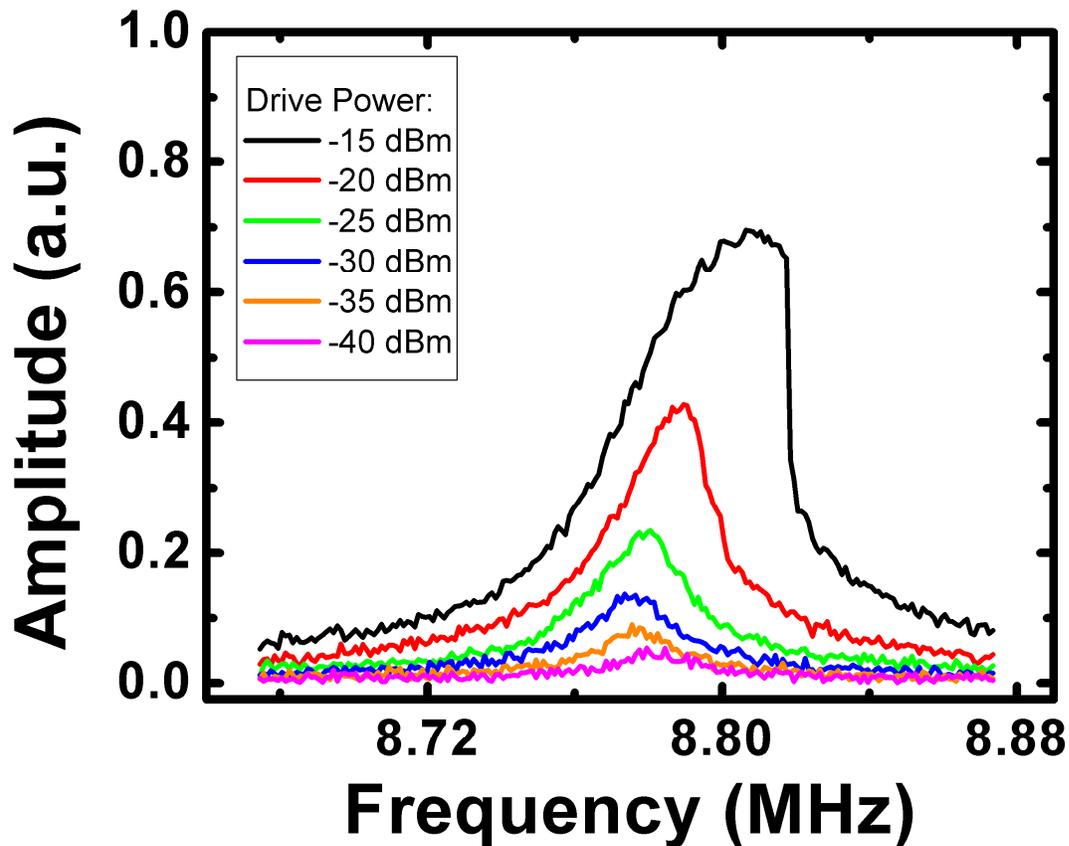

Figure S2. Frequency spectrum of a circular graphene resonator 12 µm in diameter for various driving signals. The drive powers are given in terms of the signal from the spectrum analyzer that modulates the drive laser.