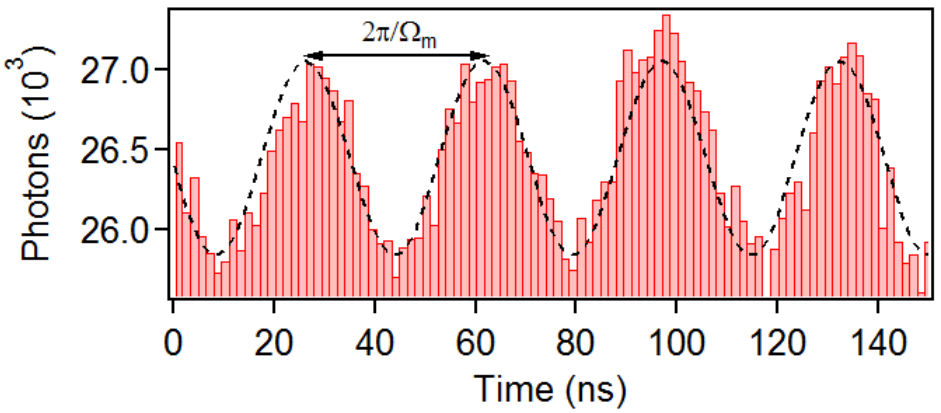
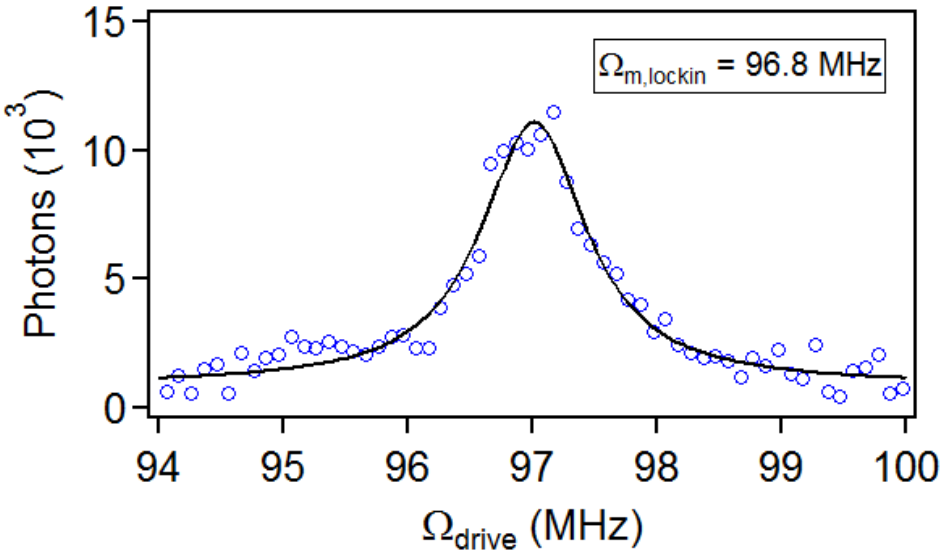
Fig. 2: Readout of graphene nano-motion via NVC emission.



a) Time trace of NVC emission (redbars) modulated by a driven graphene membrane with mechanical resonance frequency Ω_m oscillating in its near field. Distance-dependent emission quenching imprints the motion of the graphene membrane onto the emission.



b) Mechanical spectrum of a graphene membrane, extracted by Fourier transform of emission time traces. The amplitude of the component at the resonance frequency Ω_m, measured independently by interferometry, is plotted against the drive frequency Ω_{drive}, showing a peak at Ω_m.