Direct measurement of the cortical tension during the growth of membrane blebs.

Julia Peukes and Timo Betz

SUPPLEMENTARY MATERIAL:

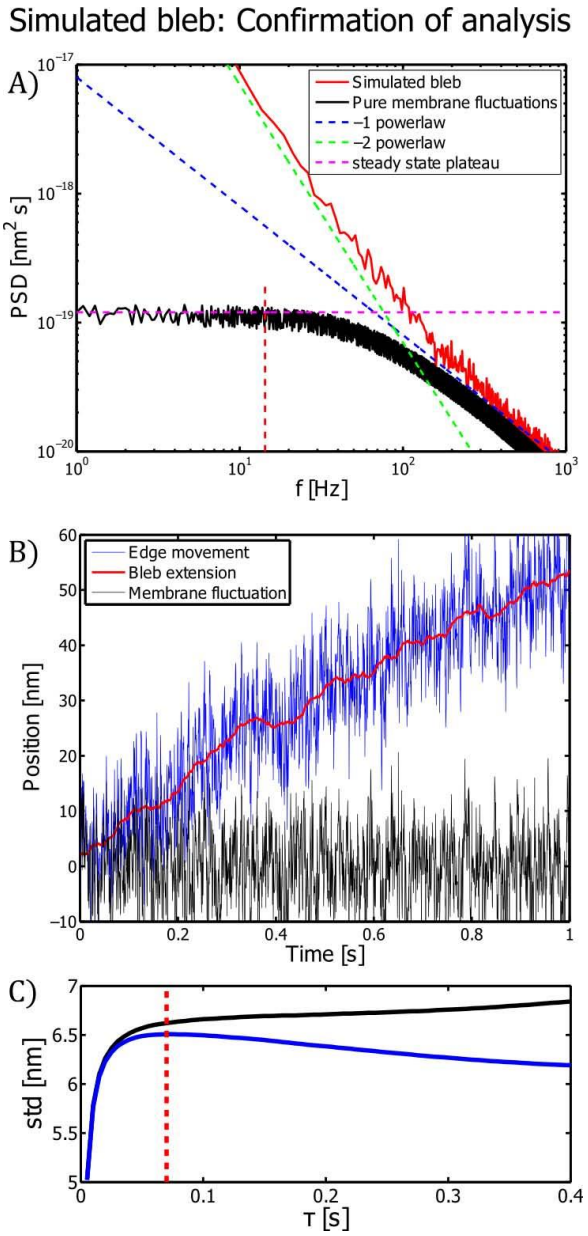

FIGURE S1: Simulated movement of a bleb presented as in figure 2 of the main text. We first simulate the PSD of a membrane with the following parameters (black panel A): σ= 50pN/µm, κ=10kT, η=0.003Pas. Subsequently we add the bleb extension of 50nm/s and calculate the PSD of the resulting membrane fluctuations (red in panel A, corresponding to blue in panel B)). The presented analysis technique was then used, and the resulting tensions determined were with VAR: 46 pN/µm PSD, 53 pN/µm similar to the imposed tension. The resulting edge movement and the approximated fluctuations are shown in B. The right smoothing window was determined as described in the text, and is given in C by the red dotted line. Please note that the timescale of the smoothing is with about 80ms about an order of magnitude longer than the crossover between the two power laws as shown in A. This is expected as described in the main text.

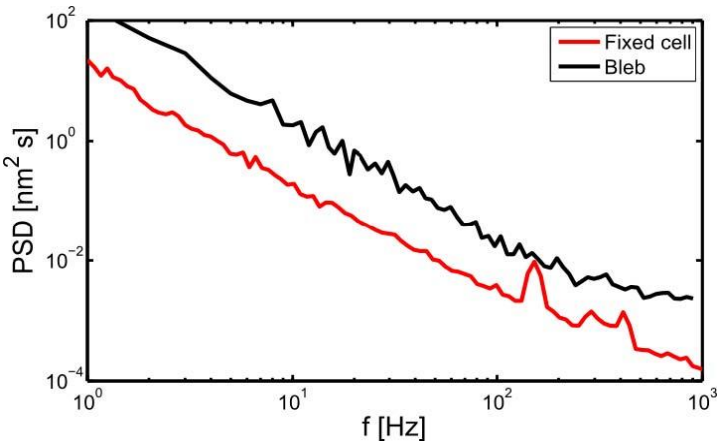

FIGURE S2: Plotting data of a extending bleb and the fluctuations of a fixed cell, to show that the fluctuations are an order of magnitude above an upper estimate of the detection limit, which is provided by the fluctuations of a fixed cell.

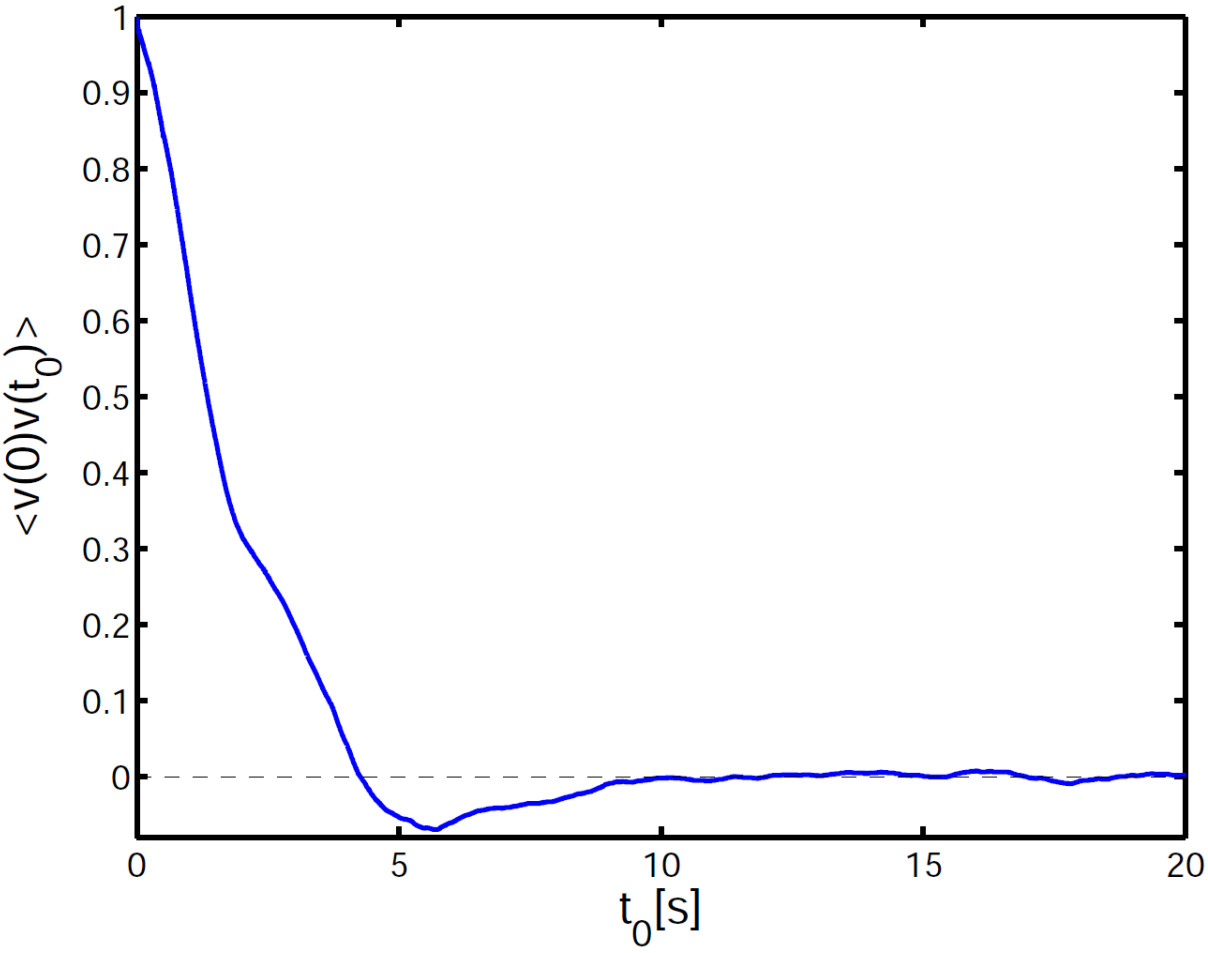

FIGURE S3: Autocorrelation of the velocity evolution presented in figure 3A. The autocorrelation decays rapidly within the first 4 seconds.

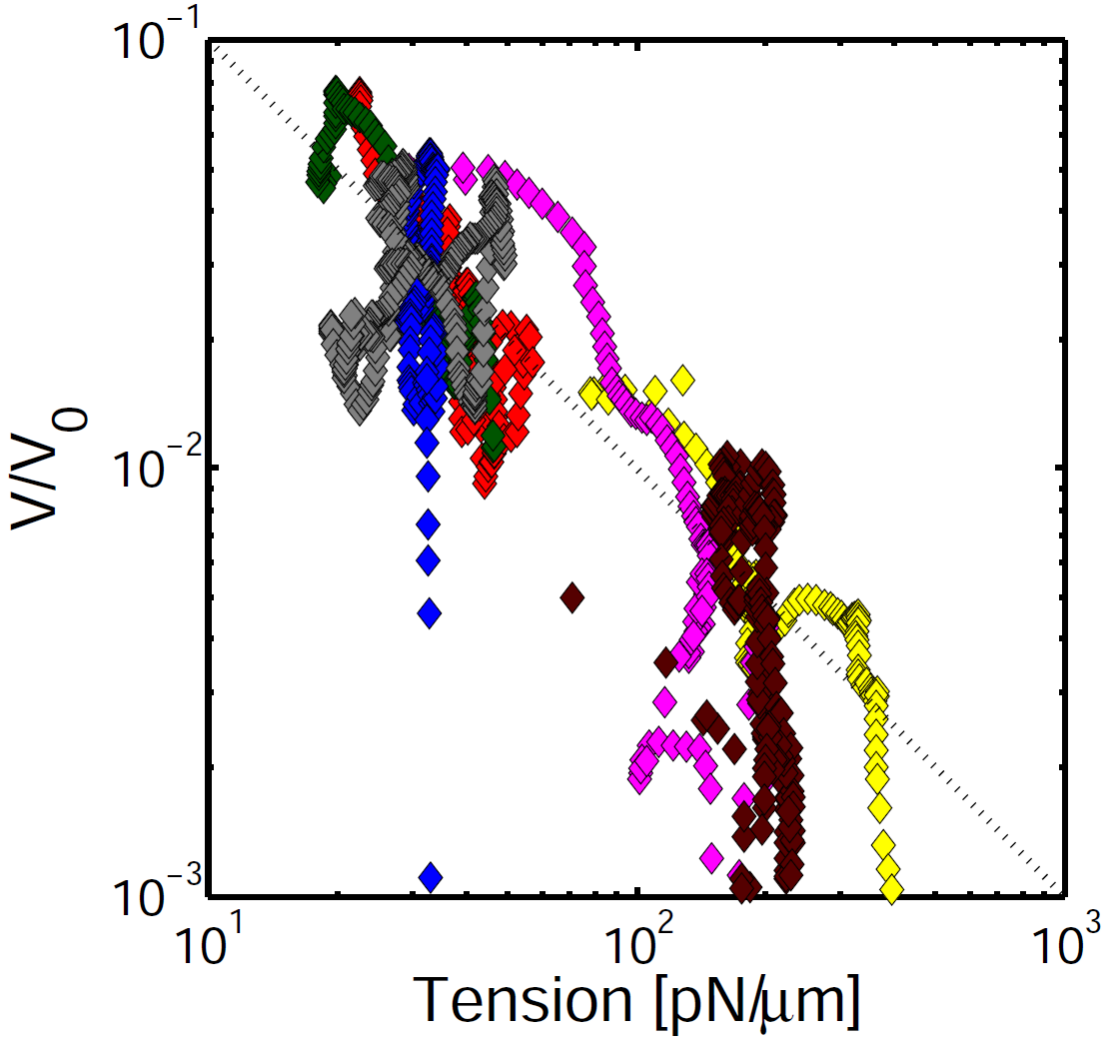

FIGURE S4: Rescaled velocity over tension plot as shown in Figure 4 of the main text, but plotting the same data analyzed using the VAR method.