# Reduction of nonspecific protein adsorption on cantilever biosensors caused by transverse resonant mode vibration

[Supplementary Materials]

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**Key words:** biofouling, immunoassay, biosensing, MEMS, resonant frequency, piezoelectric, cantilever

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These supplementary materials show results of FEM calculations of ePEMC tip vibration amplitude ($A_{x=L}$) (Figure S.1) at excitation voltage from 0-1000 mV and contain video of acoustic streaming measured using neutrally-buoyant particles (Video S.1).

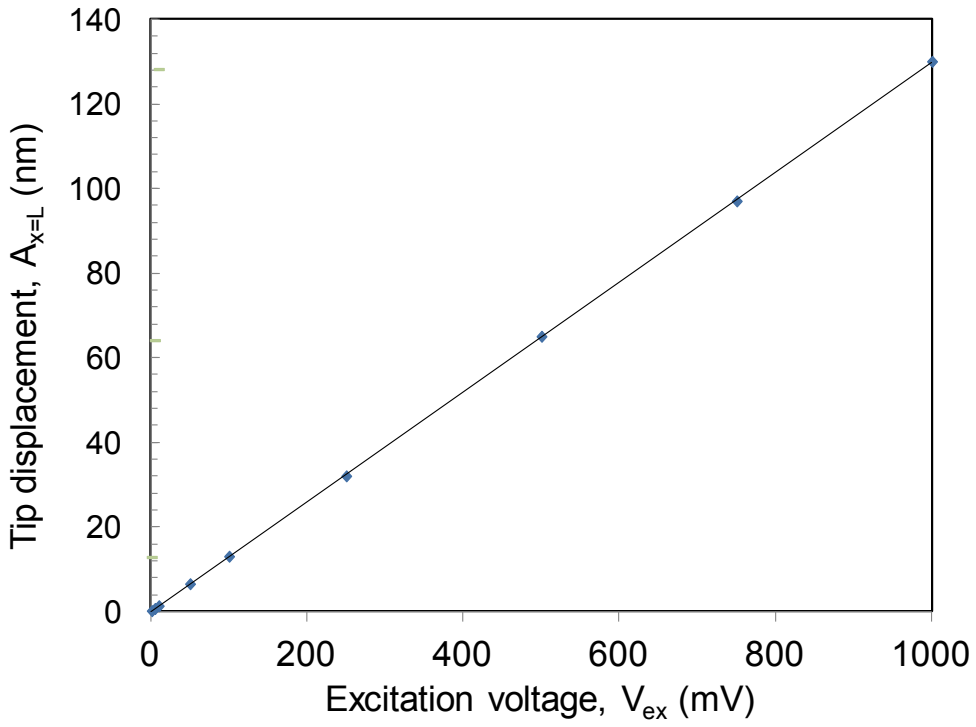


Figure S.1 – FEM calculation of the second mode tip displacement as a function of excitation voltage. A detailed description of the FEM has been previously reported.[1,2]

*Supporting information for Supplementary Video S.1*

- Video S.1 File name - (Vid. S.1) Neut. Buoyant Parts. 2nd mode (~30kHz)
- Video S.1 Title - Vibration-induced particle streaming in piezoelectric-excited millimeter-sized cantilever (PEMC) sensors.
- Video S.1 Legend - Vibration-induced particle streaming in piezoelectric-excited millimeter-sized cantilever (PEMC) sensors at second mode resonance (f ~30 kHz) under 10 V excitation. At time t=0 excitation voltage ($V_{ex}$) =0 corresponding to a static cantilever. Subsequently, the excitation voltage was increased in step changes to 0.1 V at t =15 s, 1 V at t = 30 s, 5 V at t = 45 s, and 10 V at t = 60 s. Voltage was held at 10 V for the remainder of the video.
- Video S.1 Keywords – acoustic streaming, resonant cantilever, transverse mode, particle trapping, neutrally-buoyant particles, flow visualization
- Video S.1 Format and Size - .wmv; 22.3 MB.

## References

1. H. Sharma, R. S. Lakshmanan, B. N. Johnson, R. Mutharasan, *Sens. Actuators B*, 2011, 153, 64-70.

2. B. N. Johnson, H. Sharma, R. Mutharasan, *Anal. Chem.*, 2013, 85, 1760-1766.

Electronic Supplementary Material (ESI) for Analyst