Electronic Supplementary Material (ESI) for Lab on a Chip.

Gradient in Electric Field for Particle Position Detection in Microfluidic Channels†

Lab on a chip
Supplementary Information

Authors: Miguel Solsona*, Eiko Y. Westerbeek*, Johan G. Bomer, Wouter Olthuis and Albert van den Berg

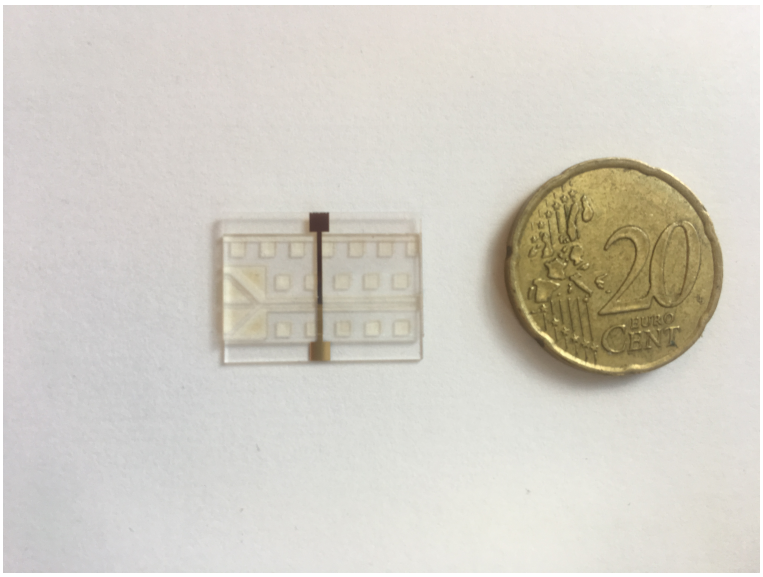

Figure S1 . Microfluidic chip used to track the position of 80μm particles.

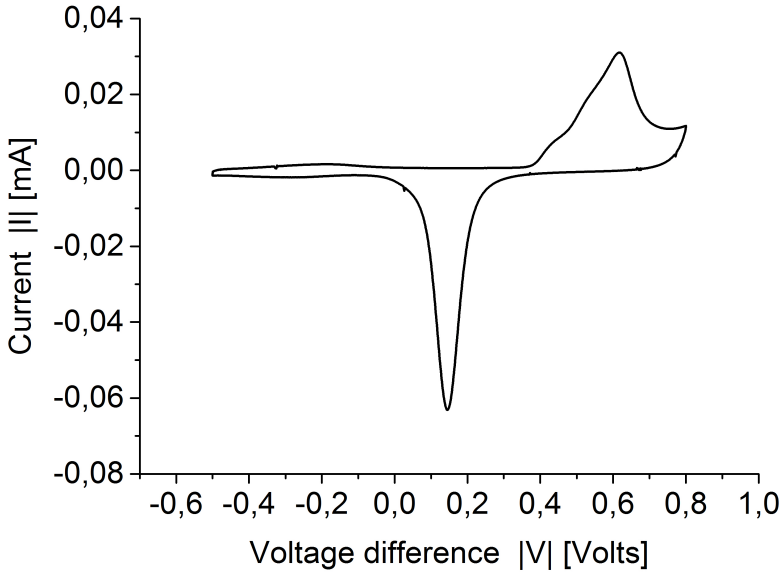

Figure S2 . Cyclic voltammogram of the gold electrodes with exposed regions to be electrodesposited with platinum black in 0.1 M H_2SO_4 solution and a scan rate of 10 mV/s.

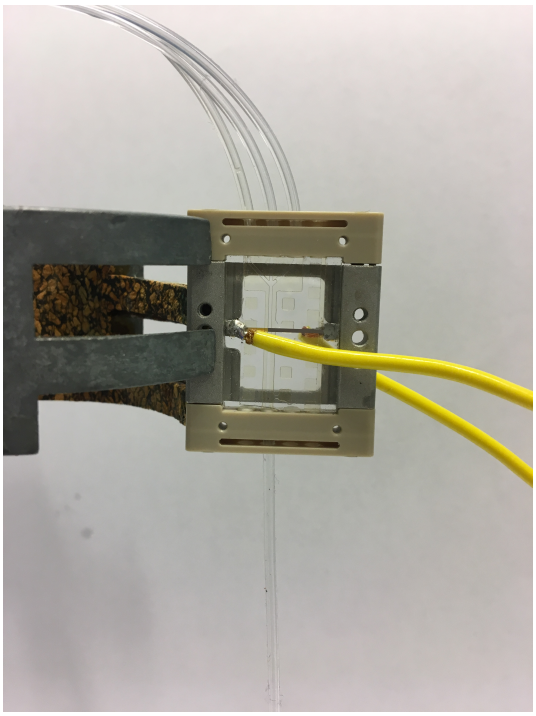

Figure S3 . Microfluidic chip and chip-holder used to measure the position and conductivity of polystyrene particles.

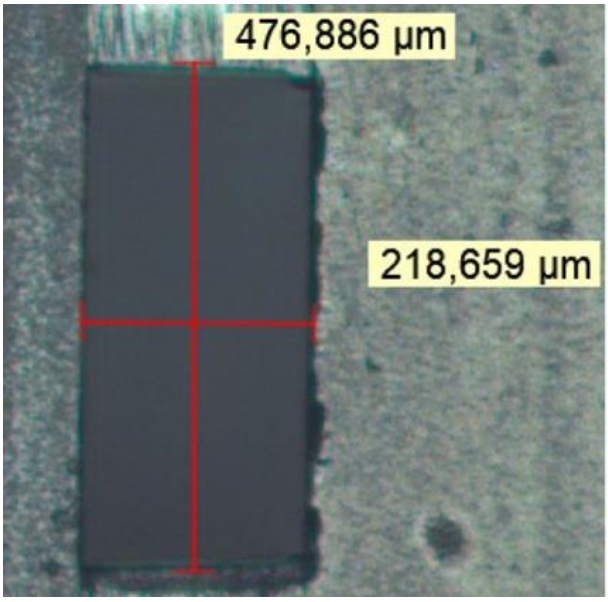

Figure S4 . Dimensions of the microfluidic channel.

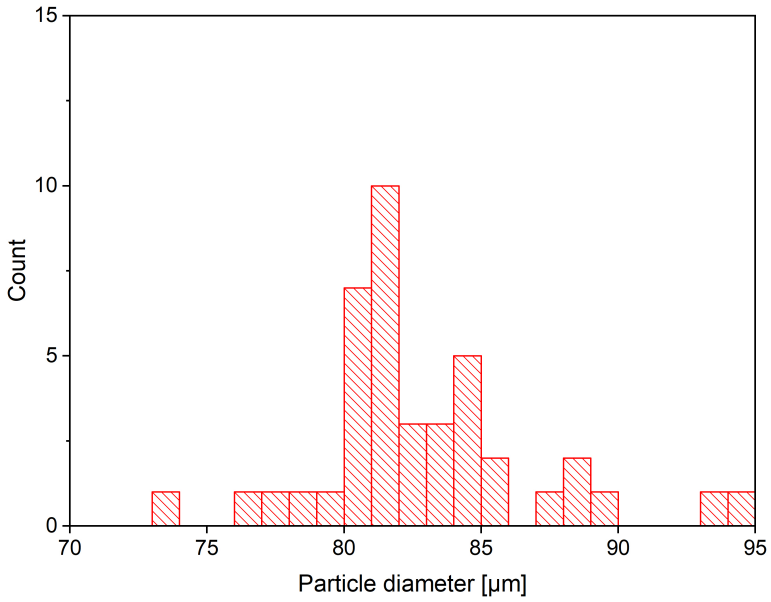

Figure S5 . Histogram of the particle size distribution of 41 polystyrene particles.

$$\Delta Z = \frac{PeakHeight}{Totalimpedanceofthesystemwithoutparticles} * 100 \quad (1)$$

Table 1 Simulated impedance of polystyrene particles with different radius at high frequency.

Radius (µm)	Frequency (ω)	Impedance (Ω)	Impedance difference with a 37 µm (Ω)
37	100000	721,13	0,00
39	100000	721,75	0,61
41,5	100000	722,60	1,47
44	100000	723,56	2,43
47	100000	724,88	3,74

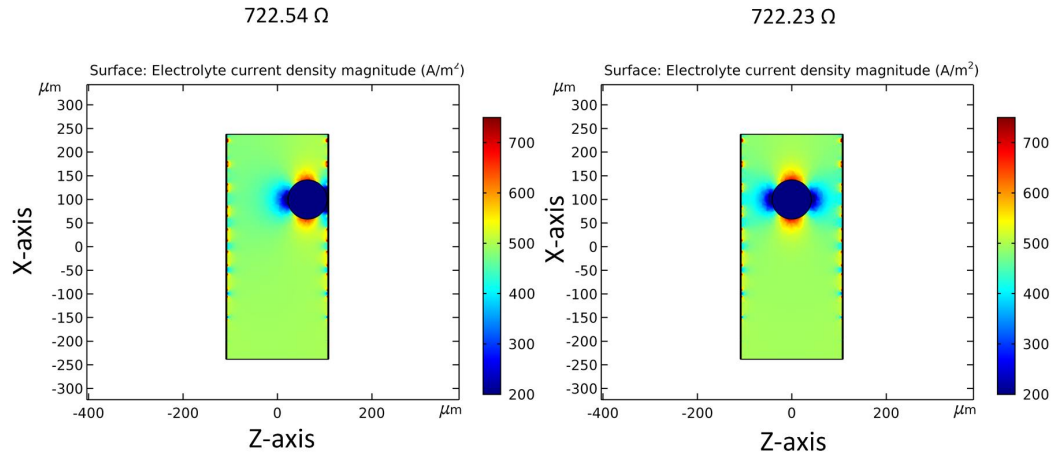

Figure S6 . FEM simulations showing differences in impedance for different z-positions of the particle. X and y-axis are the spatial length in the electrochemical cells.

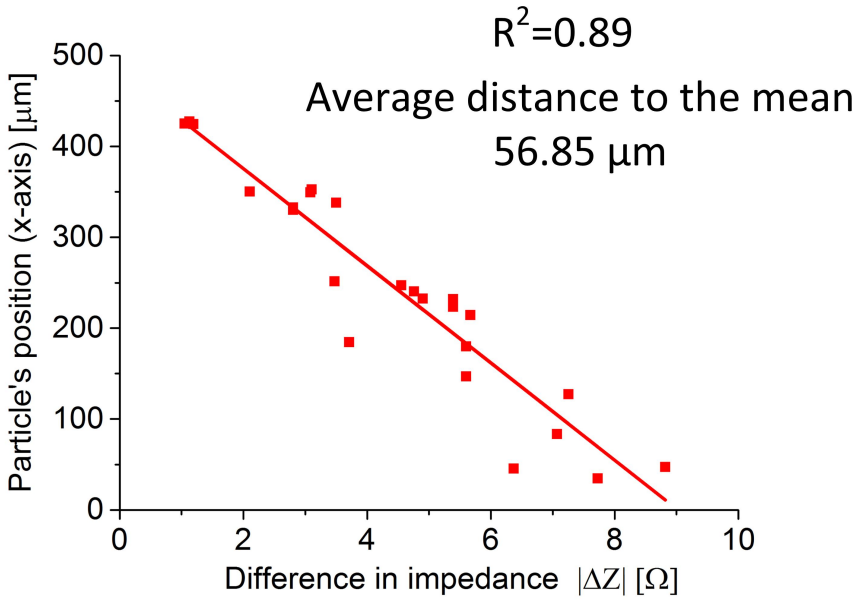

Figure S7 . Linear trendline of the experimental data at 800Hz with R^2 and average distance of the experimental data to the trendline.