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

Miniaturized, multiplexed readout of droplet-based microfluidic assays using time-domain modulation

Melaku Muluneh, Bawul Kim, Gershon Buchsbaum, David Issadore

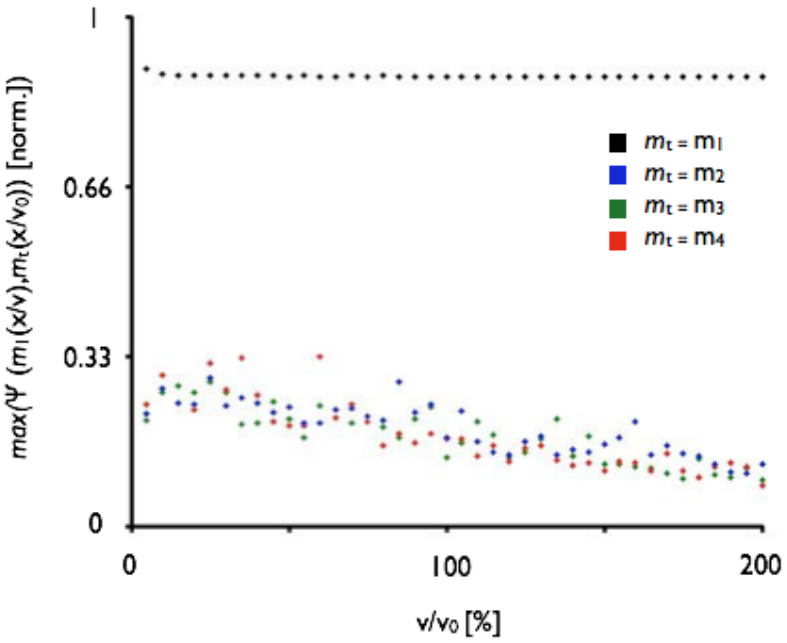

Figure S1. Characterizing the effect of velocity dispersion on false cross-correlation between channels. We characterize the effect of the droplet velocity v on false cross-correlations Ψ. To this end, we created a model in which a droplet passes through channel m_1 with velocity v. We then check the cross correlation of this signal Ψ with masks m_t = m_2, m_3, and m_4 with an expected velocity v_0. We plot the peak of the cross correlation, normalized by the energy of the length of the mask. For comparison, we also plot the peak cross-correlation for the signal with its correct mask m_1. We demonstrate that over the range of velocities v/v_0 from 5% to 200% there are not significant false cross-correlations.

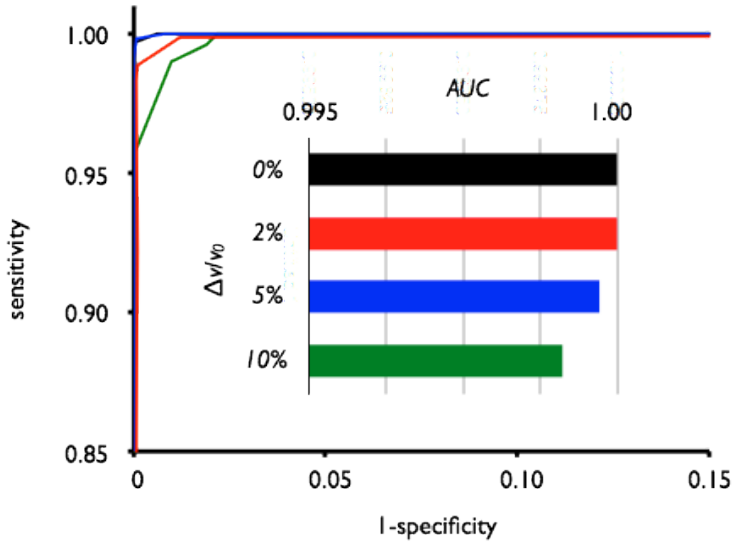

Figure S2. Characterizing the effect of acceleration on performance. The effect of linear acceleration of droplets $\Delta v/v_0$ over the length of the detection region was characterized using a model system. The results were summarized by a receiver operator characteristic (ROC) curve and quantified by the curve's area under the curve (*AUC*). The *AUC* remains unchanged as the acceleration is increased to as much as 5%. In this model the length of the mask was L = 150, and the SNR was -3 dB.