Supplementary Figure 5

(a) Graph showing 

(b) Graph showing 

(c) Graph showing 

(d) Graph showing 

(e) Graph showing 

(f) Graph showing
Supplementary Figure 5. Analytical model of Ca^{2+} diffusion and clearance in SC dendrites. (a, b, and c) top, Average synaptically-evoked fluorescence transient (noisy traces) measured in nominally ± 0.25 (red), 0.5 (black), 1 (green), 2 (blue), or 3 (green) µm stretches of dendrite centered on the peak of Ca^{2+} influx. The amplitudes of the transients are shown relative to the peak of the ± 0.25 µm fluorescence transient. The smooth colored lines show $C(\Delta x, t)$ calculated using equation 1 (Sup. Methods) and the parameters given in Sup. Table 1. bottom, Residual error of the fits shown in the top panels. The data were obtained using 300 µM Fluo4FF (a), 600 µM Fluo4FF (b), or 300 µM Fluo5F (c). (d) Data from Figure 6 plotted with lines of slope $D_{app}$ (dashed lines) obtained using equation 4 and the parameters in Sup. Table 1 for each of the three buffer conditions. (e) Data from figure 8 showing the spread of Ca^{2+} during a 30Hz, 25 stimuli train in the presence of NMDAR blockers (circles). Superimposed is the Ca^{2+} spread calculated using equation 1 and the parameters in Sup. Table 1 (line). (f) Calculation of the spatiotemporal profiles of Ca^{2+} in the dendrite following a single stimulus (top) or repetitive stimulation (bottom) in the absence of added Ca^{2+} indicator. In the lower panel, the color of the traces depict the time after the start of the stimulus train and progress from red to blue. Calculated using equation 1 with $\kappa_1 = 0$. 