

Abstract Submitted  
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**Calcium puffs: From microdomain to a channel.** DIVYA SWAMI-NATHAN, PETER JUNG, Department of Physics and Astronomy, Ohio University — Calcium puffs describe the release of calcium ( $Ca^{2+}$ ) ions from internal stores into the cytosol through clusters of up to tens of ion channels. It is believed that during the release process, when the channels open, steep  $Ca^{2+}$  concentration gradients are established around the cluster. These large local concentrations are consequential as they determine the opening and closing rates of the ion channel and therefore control receptor kinetics. We present a computational study, wherein we simulate the release and diffusion of  $Ca^{2+}$  and its interaction with buffers and indicator dyes around one channel cluster. Our goal is to relate local steep  $Ca^{2+}$  gradients with experimentally observable microdomain-averaged  $Ca^{2+}$  concentrations thereby putting the high concentration hypothesis to test.

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