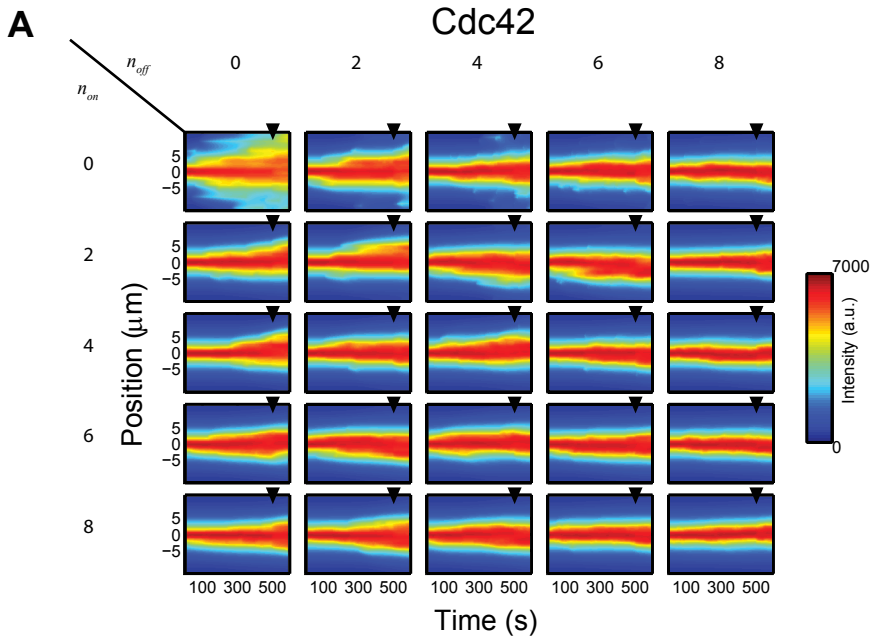

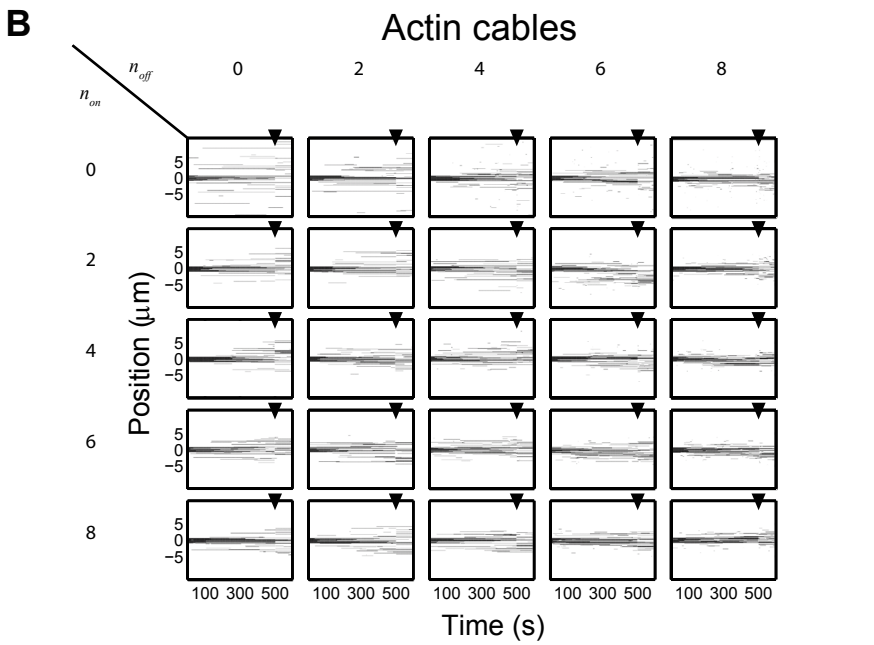

Alternative model for comparing the role of positive feedback in the actin cable attachment and detachment

(A and B) Solutions for the distributions of Cdc42 (A) and actin cable attachment sites (B) for the positive feedback models in the attachment and detachment probabilities. To account for the positive feedback in the attachment rate we used

$$P_{on}(x,t,dt) = a_{on}\, A_C\, f(x,t)dt\, \text{Feedback}_{on}(x,t,n_{on}),$$

where $\text{Feedback}_{on} = \left(f / f_0\right)^{n_{on}} / \left[1+\left(f / f_0\right)^{n_{on}}\right]$. Analogously, for the detachment rate we used

$$P_{off}(x,t,dt) = a_{off}\, dt\ \text{Feedback}_{off}(x,t,n_{off}),$$

where $\text{Feedback}_{on} = 1/\left[1+\left(f / f_0\right)^{n_{off}}\right]$ (compare with Equation (9)). At 500 seconds (arrowhead), half of the actin cables were randomly detached. Results are computed in 1-D for simplicity. Model parameter values are the mean for those previously estimated in Equation 1, and the steady-state solution was used as initial condition. For $n_{on} = 0$ we used $a_{on} = 1.6\times 10^{-4}$ a.u., and for $n_{off} = 0$ we used $a_{off} = 2.2\times 10^{-3}\ \text{s}^{-1}$; for each n_{off} and n_{on}, a_{off} and a_{on} were chosen so that at $t = 0$ cables had the same probability of detachment and attachment respectively at the cap center. For both feedback terms we used for f_0 half of the maximum value of f for the steady-state solution. The allowable number of actin attachment sites was limited to ~7% (=20/300) of the total membrane, in rough agreement with experimental observations.