Read Me

6/10/2020

Figures

In order to plot all of the figures, run plot_generator.m and follow the prompts in the command window to plot the corresponding figure in the paper

sun.m

Calculates the on rate of a catch bond in a cluster

findkoff.m

Finds the koff rate of unbinding for a catch bond cluster based on the number of closed bonds N and force f.

objj.m

Objective function for optimizing parameters in the cluster bond model

BondProbability10.m

Kolmogorov forward differential equations used to calculate the probability of each having each number of bonds in the cluster.

paramFitdeterm.m

This file is used to run the objective function and fit the parameters of the model developed for a catch bond cluster.

bondNumberFinder.m

This function outputs a matrix of the initial conditions for the Kolmogorov forward equations. It calculates the distribution of initial conditions using the experimentally measured bond adhesion probabilities plugged into a Poisson distribution.

plot_generator.m

This function plots all of the figures in the main body of the paper based on user input and the other functions.

variedIClifetime2.m

This function calculates the mean lifetime and standard deviation for the catch bond cluster over a spread of forces by integrating the equations in bondProbability10.m.

genrunner.m

Used to run the optimized variedIClifetime2.m.