Adele Douglin

Title of Poster Presentation: Numerical Integration of the Levy Motion Driven SDE with Drift Boundaries for Motile Microbes

Abstract:
A random walk solution was constructed for a Levy-motion driven, stochastic differential equation (SDE) with drift and subject to alpha-stable sticky boundaries. The model represents motile bacteria that swim in the aqueous phase but that stick to the walls for some finite period of time when contact is made. The numerical algorithm was implemented in C++. Maple Software was used to graph the movements of the microbes and ensure that they followed a Levy motion. The code evaluates the random walks and records when and where each microbe sticks to the walls of the flow tube, and for what duration it stays adsorbed. This information is very useful because the microbes are more likely to transfer genetic information when they are adsorbed. The code is currently being modified to compute first passage time distributions that will the user to see how long it takes each microbe to pass a certain point in the flow field.