This directory contains the code for one particular sensitivity analysis of the planets simulation:

Name: Subsequent mutations to feedbacks

Description: This is a second version of how to implement mutations to the feedback system, based on but not identical to Mark Garnett’s work during summer 2016. This sensitivity analysis derives ultimately from Ford Doolittle’s idea (Doolittle, 2014?) that planets can be selected without inheritance, and that mutations during the time that they host life can alter that selection process and its effect. The main issue here is how to implement the mutations. For this implementation, based on Mark Garnett’s work, the approach is to alter the dT/dt values of the feedback nodes: (1) a random number (between 1 and 15) of mutations are scheduled to occur at (uniformly) random times during the 3 By; (2) each mutation is made to affect a random number of nodes (with equal probability between 1 and all of them), although some of these nodes can be outside of the habitable range (\*); (3) the impact of each mutation on the dT/dt values of the relevant nodes is calculated from a normal distribution centred on zero: , with all affected nodes being allocated the same impact for a given mutation, rather than the effect on each node being calculated separately.

(\*) this needs to be done in order to avoid a bias such that central nodes are more frequently affected than edge nodes.

The following files were altered in order to implement this sensitivity analysis:

set\_constants.m

ts\_slave.m

The following files were created in order to implement this sensitivity analysis:

determine\_mutations.m