**README**

**BEFD Simulations**

**List of R scripts:**

* 05BEFDcreateData
* 06BEFDcalculateAUC
* 07BEFDanalyseAUC
* 08BEFDdominance

**Description of R scripts:**

The following R scripts have been used to create and analyse our simulated communities. We saved the created data frames as csv files.

05BEFDcreateData: 5 species Lotka Volterra model to create data for 3 different disturbance types and 3 Limit scenarios.

* Competition-dependent model with 5 species with the same growth rate and capacity over 450 timepoints and time step 0.5
* Disturbances are reduction in biomass: Press with intensity 0.0025, pulse with intensity 0.5 and, pulsepress with a combination of the too (one time 0.5 and continuously 0.0025)
* Limit scenarios include 3 different scenarios of species responses in a model community:
  + Limit 1: All species respond equally to the disturbance
  + Limit 2: All species are equally sensitive to the disturbance but one is resistant/ benefits
  + Limit 3: All species are equally resistant to the disturbance but one is sensitive/ struggles
* After creating the data, here I calculate the response variables needed for the AUC calculation (e.g., delta.pi, RR). See Table in MS
* Write csv LRRdata2.csv

06BEFDcalculateAUC: calculate the AUC for delta.pi and RR variables (but also totRR, mean.pi, etc.) for each species, Model, Limit, run combination

* Biomass plot for supplement
* Create USI containing unique identifier for species, Model, Limit, run combination
* AUC Loop cycling trough cases
* Calculate relative dominance
* Write csv **StabAlphaAuc.csv**

07BEFDanalyseAUC: analyses of the AUC for delta.pi and RR variables

* Uses **StabAlphaAuc.csv**
* Calculates relative competitiveness as inverse relative alpha
* Fig. 2 & Fig. 3

08BEFDdominane: creates Rank Abundance Diagrams (RAD)

* uses **StabAlphaAuc.csv**
* Ranking after con.pi of each species: con.pi = calculated dominance in the control treatment
* Plots:
  + Supplement Fig. 2: Correlation of relative alpha and dominance
  + Supplement Fig. 3: AUC and relative alpha for comparison