Description of R codes for Tuning Earth System Models Without Integrating to Statistical Equilibrium

This Github site contains the core algorithms of DelSole and Tippett (2024). Below is a brief description of each R code file.

cesm.varx.github.R
reads CESM data and calls all estimation methods. It loops through different leads and ensemble sizes, for fixed choice of S (number of spherical harmonics), p (order of the AR model), and H (number of annual harmonics.

loglikelihood.gradient.R
function for evaluating the likelihood function and associated gradient for the VARX model.

parameter.est.cGLS.R
function for performing conditional Generalized Least Squares

parameter.est.enkf.R
function for performing adaptive-KI

pdf.eps.R
function for printing PDF figure files

parameter.est.xymat.R
function that organizes the CESM data into X- and Y- matrices for regression

parameter.est.allobs.R
function for performing a (deprecated) version of cGLS. Included for backward compatibility

gev.R
function for solving generalized eigenvalue problems

kf.lm.R
function for performing Kalman Inversion using the lm function in R

References

DelSole, T. and M. K. Tippett, 2024: Tuning earth system models without integrating to statistical equilibrium. *J. Adv. Model. Earth Syst.*, **submitted**.