## Codes for Computing ARX Correction of Forecasts

**`spear.github.R`** Main code that reads data, performs all calculations, and outputs all figures of the paper. The figures are piped into the subdirectory `figures`.

**`arx.correction.R`** Computes the ARX correction given forecast, observation, and forcing time series. The ARX model is trained over the period `train.str`-`train.end`.

**`traditional.correction.R`** Computes traditional correction given forecast and observation time series. The correction is trained over the period `train.str`-`train.end`.

**Auxiliary Functions**

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|---|---|
| `timeseries2arx.cyclo` | given time series, specify X,Y matrices for writing ARX model in the form $Y = XB + E$ |
| `simulate.arx.cyclo` | given ARX coefficients, integrate the ARX model |
| `n.to.monthly` | map indices of a uniformly-spaced time series to non-uniform array |
| `lm.TrendPlusCycle` | fit time series to trend-plus-annual cycle regression model |
| `pdf.eps` | plot figure to PDF file |

**Data Sets**

| | |
|---|---|
| SPEAR.tref.60S60N.RData | Contains 60S60N mean SPEAR data in `spear.list`. Extract ssp5 |
| data.SPEAR.annual.lagged.RData | Slightly longer SPEAR data in `spear.list`. Insert ssp5 |
| CMIP6.forcing.Annex.RData | forcing time series from IPCC AR6 Annex Tables |