Package 'normalization'

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Type Package

Title Normalization of spatio-temporal datasets

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Description This package provides methods to normalize spatio-temporal datasets based on a reference period. Correction for artefacts induced by normalization and trend subraction are provided.

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R topics documented:

`linear.detrend` *A function to estimate linear trends*

Description

Estimates a linear trend.

Usage

```
linear.detrend(data)
```

Arguments

`data`	A numeric vector (e.g. a time series), from which the trend component is to be estimated

Details

This function calculates a linear trend component to use for spatio-temporal normalization.

Value

A character vector of length(data) that contains the trend components.

`normalize.spatiotemporal.cube`
A function to normalize a spatio-temporal data cube

Description

Normalization of a spatio-temporal data cube based on a reference period and correction for induced artefacts.

Usage

```
normalize.spatiotemporal.cube(data, data.trend=NA, SUBTRENDSD=F, TRENDCOR=F, ref.idx = c(1,30))
```

Arguments

`data`	3-dimensional array of the form longiutde-latitude-time
`data.trend`	(optional): 3-dimensional array with trend components in the form longitude-latitude-time or NA
`SUBTRENDSD`	Logical, should the trend be subtracted before computing the standard deviation in the reference period?
`TRENDCOR`	Logical, should the normalization correct for trends in the out-of-base period?
`ref.idx`	Numeric Vector of indices that specify the reference period (in time)

Details

This function returns a normalized spatiotemporal data cube that can be compared across space and time, given that prerequisites are fulfilled (Gaussian data, stationarity in the reference period).

Value

List with three elements: $data.original: original data array (3D-array) $data.norm: normalized array using the conventionally applied normalization $data.norm.cor: normalized array using the proposed correction

Author(s)

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References

Sippel et al, (2015) An accurate quantification of climate variability and extremes. Submitted.

SSA.detrend *A function to estimate nonlinear trends*

Description

Estimate the nonlinear trend components of a time series using Singular Spectrum Analysis. A wrapper function around filterTSeriesSSA (spectral.methods)

Usage

```
SSA.detrend(data, borders.wl, M, n.comp)
```

Arguments

data	A numeric vector (e.g. a time series), from which the trend component is to be estimated
borders.wl	See ?filterTSeriesSSA
M	See ?filterTSeriesSSA
n.comp	See ?filterTSeriesSSA

Details

This function calculates the nonlinear trend component. Currently, no padding is implemented, but will come soon.

Value

A character vector of length(data) that contains the trend components.

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