

Package ‘ICSS’

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Type Package

Title ICSS Algorithm by Inclan/Tiao (1994)

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Maintainer Siegfried Köstlmeier <siegfried.koestlmeier@gmail.com>

Description The Iterative Cumulative Sum of Squares (ICSS) algorithm by In-clan/Tiao (1994) <<https://www.jstor.org/stable/2290916>> detects multiple change points, i.e. structural break points, in the variance of a sequence of independent observations. For series of moderate size (i.e. 200 observations and beyond), the ICSS algorithm offers results comparable to those obtained by a Bayesian approach or by likelihood ratio tests, without the heavy computational burden required by these approaches.

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Depends R (>= 3.5.0)

Imports rstack

Suggests testthat

Encoding UTF-8

LazyData true

NeedsCompilation no

Author Siegfried Köstlmeier [aut, cre, cph]
(<<https://orcid.org/0000-0002-7221-6981>>)

Repository CRAN

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data	<i>Sample data for Inclan/Tiao (1994)</i>
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Description

Generated random data (n=700) with following the scheme in Inclan/Tiao (1994):

- [1;390]Mean: 0; Variance: 1.000
- [391;517]Mean: 0; Variance: 0.365
- [518;700]Mean: 0; Variance: 1.033

Usage

```
data(data)
```

Examples

```
## load data
data(data)

## calculate the variance until the first breakpoint.
data_var <- var(data[1:390])
```

ICSS	<i>Iterative Cumulative Sum of Squares (ICSS)</i>
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Description

ICSS implements the Iterative Cumulative Sum of Squares (ICSS) algorithm by Inclan/Tiao (1994). The test detects structural breakpoints in the variance of time series data.

Usage

```
ICSS(data, demean = FALSE)
```

Arguments

data	A numerical vector
demean	An object of class " logical ": If demean is TRUE, all data will get demeaned prior to the ICSS algorithm.

Value

ICSS returns a numerical vector containing the location of structural breakpoints or NA if none breakpoints are found.

References

Inclan, C., & Tiao, G. C. (1994): Use of cumulative sums of squares for retrospective detection of changes of variance. *Journal of the American Statistical Association*, 89(427), 913-923. <https://www.jstor.org/stable/2290916>.

Examples

```
## load demo data
data(data)
breakpoints <- ICSS(data)
```

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