

# Package ‘sdat’

April 21, 2016

**Type** Package

**Title** Signal Detection via Adaptive Test

**Version** 1.0

**Date** 2016-04-21

**Author** Yichi Zhang [aut, cre]

**Maintainer** Yichi Zhang <yzhang52@ncsu.edu>

**Description** Test the global null in linear models using marginal approach.

**License** GPL (>= 2)

**NeedsCompilation** yes

**Repository** CRAN

**Date/Publication** 2016-04-21 22:13:08

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sdat-package	<i>Signal Detection via Adaptive Test</i>
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## Description

Test the global null in linear models using marginal approach.

**Details**

The DESCRIPTION file:

```
Package:      sdat
Type:        Package
Title:       Signal Detection via Adaptive Test
Version:     1.0
Date:       2016-04-21
Authors@R:   c(person("Yichi", "Zhang", role = c("aut", "cre"), email = "yzhang52@ncsu.edu"))
Author:      Yichi Zhang [aut, cre]
Maintainer:  Yichi Zhang <yzhang52@ncsu.edu>
Description: Test the global null in linear models using marginal approach.
License:     GPL (>= 2)
```

Index of help topics:

```
marginal.test      Tests for signal detection via marginal
                   approach
sdatt-package      Signal Detection via Adaptive Test
```

The main function is `marginal.test`.

**Author(s)**

```
Yichi Zhang [aut, cre]
Maintainer: Yichi Zhang <yzhang52@ncsu.edu>
```

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```
marginal.test      Tests for signal detection via marginal approach
```

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**Description**

Conduct the sum-test, max-test and adaptive-test for testing  $\beta = 0$  in a linear model  $y = x^T \beta + \epsilon$ .

**Usage**

```
marginal.test(x, y, n_sim = 5000L)
```

**Arguments**

```
x          the predictors, an n by p matrix
y          the responses, a vector of length n
n_sim      the number of resampling simulations to obtain the null distribution of the test
           statistic
```

**Details**

See the reference for a detailed description of the method.

**Value**

`marginal.test` returns a self-explanatory named vector.

**References**

Zhang, Y., Laber E. B. (2015). Comment on "An adaptive resampling test for detecting the presence of significant predictors". *Journal of the American Statistical Association*, 110(512), 1451-1454.

**Examples**

```
n <- 100
p <- 10
x <- matrix(rnorm(n * p), n, p)
y <- 0.2 * x[, 1] + rnorm(n)
result <- marginal.test(x, y)
result[1 : 3] # gives p-values of max-test, sum-test and adaptive-test
result[4]    # gives running time in seconds
```

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