

# Package: knox (via r-universe)

October 19, 2026

**Type** Package

**Title** Knox test

**Version** 1.0.1

**Date** 2026-10-19

**Author** Thanh Le Viet

**Maintainer** Thanh Le Viet <lethanhx2k@gmail.com>

**Description** Knox test for space-time interaction

**License** GPL (>= 2)

**Imports** Rcpp (>= 0.11.3)

**LinkingTo** Rcpp, RcppArmadillo

**Suggests** sf, testthat

**Repository** <https://fdzul.r-universe.dev>

**Date/Publication** 2026-10-19 18:37:07 UTC

**RemoteUrl** <https://github.com/fdzul/knox>

**RemoteRef** HEAD

**RemoteSha** 83e34182ba873e6bb1594f98093bc95c6a9f3ea8

## Contents

|                    |          |
|--------------------|----------|
| knox . . . . .     | 2        |
| knox_mc . . . . .  | 2        |
| st_link . . . . .  | 3        |
| writeSHP . . . . . | 4        |
| <b>Index</b>       | <b>5</b> |

---

|      |                           |
|------|---------------------------|
| knox | <i>Original Knox test</i> |
|------|---------------------------|

---

### Description

Original Knox test

### Usage

```
knox(x, y, time, sigma, tau)
```

### Arguments

|       |                                                    |
|-------|----------------------------------------------------|
| x     | Longitude, should be projected to a planar system. |
| y     | Latitude, should be projected to a planar system.  |
| time  | time column.                                       |
| sigma | a distance in space.                               |
| tau   | a distance in time.                                |

### Value

A knox statistic, which is the number of pairs of points found in a given space-time distance.

### References

**Knox, E. (1964).** *The detection of space-time interactions.* Journal of the Royal Statistical Society. Series C (13(1), 25-30.

**Tango, T. (2010).** *Statistical methods for disease clustering.* Springer.

---

|         |                                              |
|---------|----------------------------------------------|
| knox_mc | <i>Knox test with Monte Carlo simulation</i> |
|---------|----------------------------------------------|

---

### Description

Performing Knox statistics with Monte Carlo simulation

### Usage

```
knox_mc(x, y, time, sigma, tau, perm = 999L)
```

**Arguments**

|       |                                                    |
|-------|----------------------------------------------------|
| x     | Longitude, should be projected to a planar system. |
| y     | Latitude, should be projected to a planar system.  |
| time  | time column.                                       |
| sigma | a distance in space.                               |
| tau   | a distance in time.                                |
| perm  | Number of simulations. Default is 999              |

**Value**

|         |                                                                                                    |
|---------|----------------------------------------------------------------------------------------------------|
| knox    | Knox statistic, which is the number of pairs of points found in a given space-time distance.       |
| p_value | p-value calculated from simulation                                                                 |
| RR      | Relative Risk - calculated by observed value (Knox statistics) divided by mean of simulated values |

---

|         |                        |
|---------|------------------------|
| st_link | <i>space-time link</i> |
|---------|------------------------|

---

**Description**

Create space-time links between two points from a given space and time distance.

**Usage**

```
st_link(x, y, time, ds, dt)
```

**Arguments**

|      |                                                     |
|------|-----------------------------------------------------|
| x    | Longitude - should be projected to a planar system. |
| y    | Latitude - should be projected to a planar system.  |
| time | time                                                |
| ds   | a distance in space.                                |
| dt   | a distance in time.                                 |

**Value**

A data frame with

|        |                            |
|--------|----------------------------|
| Xo, Yo | X, Y of the starting point |
| Xd, Yd | X, Y of the ending point   |

---

`writeSHP`*Writing shapefile of space-time links*

---

**Description**

Writing shapefile from a data frame of space-time links

**Usage**

```
writeSHP(data, x, y, time, ds, dt, w = TRUE, file.out = "st_links", ...)
```

**Arguments**

|                       |                                                                      |
|-----------------------|----------------------------------------------------------------------|
| <code>data</code>     | A data frame holds at least 3 columns: longitude, latitude and time. |
| <code>x</code>        | Longitude, should be projected to a planar system.                   |
| <code>y</code>        | Latitude, should be projected to a planar system.                    |
| <code>time</code>     | time column.                                                         |
| <code>ds</code>       | a cut-off distance in space.                                         |
| <code>dt</code>       | a cut-off distance in time.                                          |
| <code>w</code>        | default is TRUE, to write out a shapefile.                           |
| <code>file.out</code> | default is "st_links", shapfile name to be written.                  |
| <code>...</code>      | parameters of the plot function of a line, i.e col, width, etc.      |

**Value**

A plot of space-time links in lines. By default, `w` is set TRUE, a shapefile will be written out as well.

**Author(s)**

Thanh Le Viet, <lethanhx2k@gmail.com>

**See Also**

[st\\_links](#)

# Index

knox, [2](#)  
knox\_mc, [2](#)  
  
st\_link, [3](#)  
st\_links, [4](#)  
  
writeSHP, [4](#)