Package 'RCarb'

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Type Package

Title Dose Rate Modelling of Carbonate-Rich Samples

Version 0.1.0

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Description Dose rate modelling for carbonate-
rich samples in the context of trapped charged dating (e.g., luminescence dating) applications.

Depends R (>= 3.3.0), utils

Imports interp (>= 1.0), matrixStats (>= 0.50.0)

Suggests R.rsp (>= 0.42.0)

License GPL-3

Encoding UTF-8

LazyData true

VignetteBuilder R.rsp

RoxygenNote 6.1.0

NeedsCompilation no

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`RCarb-package` *RCarb - Dose Rate Modelling of Carbonate-Rich Samples*

Description

The package provides a dose rate modelling for carbonate-rich samples in the context of trapped charged dating (e.g., luminescence dating) applications.

Package:	RCarb
Type:	Package
Version:	0.1.0
Date:	2018-10-03
License:	GPL-3

References

This package bases on a MATLAB programme with name 'Carb', details can be found the following references:

Mauz, B., Hoffmann, D., 2014. What to do when carbonate replaced water: Carb, the model for estimating the dose rate of carbonate-rich samples. Ancient TL 32, 24–32.

Nathan, R.P., Mauz, B., 2008. On the dose-rate estimate of carbonate-rich sediments for trapped charge dating. Radiation Measurements 43, 14–25. doi:10.1016/j.radmeas.2007.12.012

`Example_Data` *Example data*

Description

Example data

Format

`Example_Data`: data.frame

Version

0.1.0

Examples

```
## show first 5 elements of the METADATA and DATA elements in the terminal
data(Example_Data, envir = environment())
head(Example_Data)
```

`model_DoseRate` *Model dose rate evolution in carbonate-rich samples*

Description

This function models the dose rate evolution in carbonate enrich environments. For the calculation internal functions are called.

Usage

```
model_DoseRate(data, length_step = 1L, max_time = 500L, n.MC = 100,
  method_control = list(), txtProgressBar = TRUE, verbose = TRUE,
  plot = TRUE, ...)
```

Arguments

`data`	data.frame (**required**): input data following the structure given in the example data set `data(Example_Data)`. The input data.frame should have at least one row (i.e. values for one sample). For multiple rows the function is automatically re-called.
`length_step`	numeric (with default): step length used for the calculation
`max_time`	numeric (with default): maximum temporal search range
`n.MC`	numeric (with default): number of Monte Carlo runs used for the error calculation
`method_control`	(*optional*): additional arguments that can be provided to the control the the modelling. See details for further information.
`txtProgressBar`	logical (with default): enables/disables the `txtProgressBar` for the MC runs
`verbose`	logical (with default): enables/disables verbose mode
`plot`	logical (with default): enables/disables plot output
`...`	further arguments passed to the underyling plot functions, see also details for further information. Supported standard arguments are `mfrow`, `xlim`, `xlab`.

Details

TODO

Value

The function returns numerical and graphical output

`[ NUMERICAL OUTPUT ]`

- A data.frame which is the combination of the input and values calculated by this function.

`[ GRAPHICAL OUTPUT ]`

- Two plots are returned: ##TODO

Function version

0.1.0

Author(s)

Sebastian Kreutzer, IRAMAT-CRP2A, UMR 5060, Université Bordeaux Montagine (France); based on MATLAB code given in Carb_2007a

References

Mauz, B., Hoffmann, D., 2014. What to do when carbonate replaced water: Carb, the model for estimating the dose rate of carbonate-rich samples. Ancient TL 32, 24–32.

Nathan, R.P., Mauz, B., 2008. On the dose-rate estimate of carbonate-rich sediments for trapped charge dating. Radiation Measurements 43, 14–25. doi:10.1016/j.radmeas.2007.12.012

Examples

```
##load example data
data("Example_Data", envir = environment())

##run the function for one sample from
##the dataset
model_DoseRate(
data = Example_Data[14,],
n.MC = 2,
txtProgressBar = FALSE
)
```

Reference_Data *Reference data*

Description

Reference data

Format

`ref`: data.frame

Version

0.1.0

`write_InputTemplate` *Write table input template*

Description

This function creates a template table that can be used as input for the function model_DoseRate

Usage

```
write_InputTemplate(file = NULL, ...)
```

Arguments

`file`	character (optional): output path, if `NULL` nothing is written, but a template data.frame is returned.
`...`	additional arguments that can be passed to function write.table if `file != NULL`. Supported arguments are: `sep`, `dec`, fileEncoding‘

Function version

0.1.0

Author(s)

Sebastian Kreutzer, IRAMAT-CRP2A, UMR 5060, CNRS - Université Bordeaux Montaigne (France)

See Also

Example_Data, write.table

Examples

```
write_InputTemplate()

## Not run:
##Example with file output
write_InputTemplate(file = "~/Desktop/Input.csv")


## End(Not run)
```

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