

Package ‘RLumSTARR’

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Type Package

Title Spatially Resolved Radiofluorescence Analysis (EXPERIMENTAL PACKAGE)

Version 0.1.0.9000-58

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Description Analysing spatially resolved radiofluorescence data using ImageJ. A collection of functions to support early work on the subject.

License GPL-3

Depends R (>= 3.5.0),
utils,
methods

Imports Luminescence (>= 0.9.8),
rjags (>= 4-8),
coda (>= 0.19-1)

Encoding UTF-8

Language en-GB

LazyData true

RoxygenNote 7.1.1

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RLumSTARR-package	<i>SpaTiAlly Resolved Radiofluorescence</i>
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Description

A collection of functions to analyse spatially resolved radiofluorescence data

Details

Funding

- Sebastian Kreutzer received funding from the European Union's Horizon 2020 research and innovation programme under the Marie Skłodowska-Curie grant agreement No 844457 (CREDit).

Author(s)

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Dirk Mittelstrass (Germany) , RLum Developer Team

References

##TODO

create_RFCurveArray	<i>Create Multidimensional Curve Arrays from File input</i>
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Description

Helper function to create a multidimensional curve array to prepare the Bayesian process

Usage

```
create_RFCurveArray(files)
```

Arguments

files **list (required)**: list of .rf files to be imported

Value

Returns a list with two arrays for the RF_nat and the RF_reg curve

Function version

0.1.0

How to cite

Kreutzer, S., 2021. create_RFCurveArray(): Create Multidimensional Curve Arrays from File input. Function version 0.1.0. In: Kreutzer, S., Mittelstrass, D., 2021. RLumSTARR: Spatially Resolved Radiofluorescence Analysis (EXPERIMENTAL PACKAGE). R package version 0.1.0.9000-58.

Author(s)

Sebastian Kreutzer, Geography & Earth Sciences, Aberystwyth University (United Kingdom) ,
RLum Developer Team

Examples

```
##TODO
```

extract_TRUELight	<i>Extract True Light from the Camera Measurements using a Bayesian Approach</i>
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Description

A Bayesian modelling approach to extract the true light using the expanding region-of-interest (ROI) approach proposed by Cunningham and Clark-Balzan (2017). The function will return the results for a single curve.

Usage

```
extract_TRUELight(data, ROI = 1, method_control = list())
```

Arguments

data **array (required)**: curve array created by [create_RFCurveArray](#)
ROI **numeric** (with default): ROI to be analysed
method_control **list** (optional): parameter to be passed to rjags. Supported are n.chain, n.iter, thin, variable.names, model

Value

Returns a list with an [Luminescence::RLum.Data.Curve](#) object (the RF curve with the true light) and the [rjags::coda.samples](#) output for further processing. *Note: Regardless the observed variable, the parameter alpha will be always be used to create the curve*

Function version

0.1.0

How to cite

Kreutzer, S., 2021. extract_TRUELight(): Extract True Light from the Camera Measurements using a Bayesian Approach. Function version 0.1.0. In: Kreutzer, S., Mittelstrass, D., 2021. RLum-STARR: Spatially Resolved Radiofluorescence Analysis (EXPERIMENTAL PACKAGE). R package version 0.1.0.9000-58.

Author(s)

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References

Cunningham, A.C., Clark-Balzan, L., 2017. Overcoming crosstalk in luminescence images of mineral grains. *Radiation Measurements* 106, 498–505. doi:10.1016/j.radmeas.2017.06.004

Examples

```
##TODO
```

get_MCMCParameter	<i>Extracts a parameter from an MCMC list</i>
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Description

Short cut to extract a parameter from an MCMC list. If more processing is wanted, the 'coda' package can be used

Usage

```
get_MCMCParameter(mcmc, parameter, prob = 0.95, unlist = TRUE)
```

Arguments

mcmc	coda::mcmc or coda::mcmc.list (required) input
parameter	character (required): name of the parameter to be extracted
prob	numeric (<i>with default</i>): probability for the HPD calculation
unlist	logical (<i>with default</i>): if TRUE the output is a matrix otherwise a list

Value

Returns a matrix with the parameter value or a [list](#)

Function version

0.1.0

How to cite

Kreutzer, S., 2021. `get_MCMCParameter()`: Extracts a parameter from an MCMC list. Function version 0.1.0. In: Kreutzer, S., Mittelstrass, D., 2021. *RLumSTARR: Spatially Resolved Radiofluorescence Analysis (EXPERIMENTAL PACKAGE)*. R package version 0.1.0.9000-58.

Author(s)

Sebastian Kreutzer, Geography & Earth Sciences, Aberystwyth University (United Kingdom) ,
RLum Developer Team

See Also

[coda::HPDinterval](#)

Examples

```
##TODO
```

run_ImageJ	<i>Run ImageJ SR-RF macro</i>
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Description

The script runs the SR-RF ImageJ macro in batch mode out of R

Usage

```
run_ImageJ(
  path,
  RF_nat = "default",
  RF_reg = "default",
  bg_rm = "take_from_RF_reg",
  image_group_size = 5,
  image_alignment = TRUE,
  first_slices_rm = FALSE,
  noise_tolorance = 10,
  ROI_size = 10,
  center_x = 0.5,
  center_y = 0.5,
  diameter = 0.9,
  use_predefined_ROIs = FALSE,
  channel_time = 5,
  save_workflow_images = FALSE,
  save_additional_results = FALSE,
  save_signal_decay_videos = FALSE,
  offset_time = 0,
  .ImageJ = "/Applications/Fiji.app/Contents/MacOS/ImageJ-macosx"
)
```

Arguments

path	character (required) : path to files to be analysed
RF_nat	character (default) : name of the RF_nat file
RF_reg	character (default) : name of the RF_reg file
bg_rm	character (with default) : background subtraction options. Allowed are none (no background subtraction), take_from_RF_reg (takes the last 100 channels from the RF_reg signal: dangerous) or <your file name> (this does not work in batch mode)
image_group_size	numeric (with default) : grouping value for running median to remove outliers
image_alignment	logical (with default) : enable/disable image alignment
first_slices_rm	logical (with default) : remove first slice of each curve set

noise_tolerance **numeric** (*with default*): noise tolerance parameter

ROI_size **numeric** (*with default*): ROI size in pixel

center_x **numeric** (*with default*): aliquot ROI centre x-coordinate

center_y **numeric** (*with default*): aliquot ROI centre y-coordinate

diameter **numeric** (*with default*): relative diameter aliquot ROI

use_predefined_ROIs **logical** (*with default*): use pre-defined ROIs imported from a file ROIs.zip found in the same folder as the files

channel_time **numeric** (*with default*): channel time, this parameter was set the moment the sequence was written

save_workflow_images **logical** (*with default*): enable/disable writing of additional workflow images

save_additional_results **logical** (*with default*): enable/disable writing of additional workflow images

save_signal_decay_videos **logical** (*with default*): enable/disable writing of additional workflow videos

offset_time **numeric** (*with default*): offset time for the time axis

.ImageJ **numeric** (*with default*): Path to ImageJ (the macro is shipped with the package)

Value

This functions returns the path of the analysed data

Function version

0.1.0

How to cite

Kreutzer, S., 2021. run_ImageJ(): Run ImageJ SR-RF macro. Function version 0.1.0. In: Kreutzer, S., Mittelstrass, D., 2021. RLumSTARR: Spatially Resolved Radiofluorescence Analysis (EXPERIMENTAL PACKAGE). R package version 0.1.0.9000-58.

Author(s)

Sebastian Kreutzer, Geography & Earth Sciences, Aberystwyth University (United Kingdom) ,
RLum Developer Team

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