

# Package ‘alabaster.se’

May 29, 2024

**Title** Load and Save SummarizedExperiments from File

**Version** 1.4.1

**Date** 2024-05-21

**License** MIT + file LICENSE

**Description** Save SummarizedExperiments into file artifacts, and load them back into memory. This is a more portable alternative to serialization of such objects into RDS files. Each artifact is associated with metadata for further interpretation; downstream applications can enrich this metadata with context-specific properties.

**Depends** SummarizedExperiment, alabaster.base

**Imports** methods, alabaster.ranges, alabaster.matrix, BiocGenerics, S4Vectors, IRanges, GenomicRanges, jsonlite

**Suggests** rmarkdown, knitr, testthat, BiocStyle

**VignetteBuilder** knitr

**RoxygenNote** 7.3.1

**biocViews** DataImport, DataRepresentation

**git\_url** <https://git.bioconductor.org/packages/alabaster.se>

**git\_branch** RELEASE\_3\_19

**git\_last\_commit** eb38c1c

**git\_last\_commit\_date** 2024-05-21

**Repository** Bioconductor 3.19

**Date/Publication** 2024-05-29

**Author** Aaron Lun [aut, cre]

**Maintainer** Aaron Lun <[infinite.monkeys.with.keyboards@gmail.com](mailto:infinite.monkeys.with.keyboards@gmail.com)>

## Contents

emptyRowRanges . . . . .	2
readRangedSummarizedExperiment . . . . .	2
readSummarizedExperiment . . . . .	3
saveRangedSummarizedExperiment . . . . .	4
saveSummarizedExperiment . . . . .	6

**Index****8**


---

emptyRowRanges	<i>Is the rowRanges empty?</i>
----------------	--------------------------------

---

**Description**

Check the `rowRanges` of a `RangedSummarizedExperiment` is empty, i.e., a `GRangesList` with no ranges.

**Usage**

```
emptyRowRanges(x)
```

**Arguments**

`x` A `RangedSummarizedExperiment` object or the contents of its `rowRanges`.

**Details**

Metadata in `mcols` is ignored for the purpose of this discussion, as this can be moved to the `rowData(x)` of the base `SummarizedExperiment` class without loss. In other words, non-empty `mcols` will not be used to determine that the `rowRanges` is not empty. However, non-empty fields in the `metadata` or in the inner `mcols` of the `GRanges` will trigger a non-emptiness decision.

**Value**

A logical scalar indicating whether `x` has empty `rowRanges`.

**Examples**

```
emptyRowRanges(SummarizedExperiment())
emptyRowRanges(SummarizedExperiment(rowRanges=GRanges()))
emptyRowRanges(SummarizedExperiment(rowRanges=GRangesList()))
```

---

```
readRangedSummarizedExperiment
```

*Read a RangedSummarizedExperiment from disk*

---

**Description**

Read a `RangedSummarizedExperiment` from its on-disk representation. This is usually not directly called by users, but is instead called by dispatch in `readObject`.

**Usage**

```
readRangedSummarizedExperiment(path, metadata, ...)
```

**Arguments**

path	String containing a path to a directory, itself created using the <a href="#">saveObject</a> method for <a href="#">RangedSummarizedExperiment</a> objects.
metadata	Named list of metadata for this object, see <a href="#">readObjectFile</a> for details.
...	Further arguments passed to <a href="#">readSummarizedExperiment</a> and internal <a href="#">altReadObject</a> calls.

**Value**

A [RangedSummarizedExperiment](#) object.

**Author(s)**

Aaron Lun

**See Also**

"[saveObject,RangedSummarizedExperiment-method](#)", to save the [RangedSummarizedExperiment](#) to disk.

**Examples**

```
# Mocking up an experiment:
mat <- matrix(rpois(10000, 10), ncol=10)
colnames(mat) <- letters[1:10]
rownames(mat) <- sprintf("GENE_%i", seq_len(nrow(mat)))

gr <- GRanges("chrA", IRanges(1:1000, width=10))
se <- SummarizedExperiment(list(counts=mat), rowRanges=gr)
se$stuff <- LETTERS[1:10]
rowData(se)$blah <- runif(1000)
metadata(se)$whee <- "YAY"

tmp <- tempfile()
saveObject(se, tmp)
readObject(tmp)
```

---

readSummarizedExperiment

*Read a SummarizedExperiment from disk*

---

**Description**

Read a [SummarizedExperiment](#) from its on-disk representation. This is usually not directly called by users, but is instead called by dispatch in [readObject](#).

**Usage**

```
readSummarizedExperiment(path, metadata, ...)
```

**Arguments**

path	String containing a path to a directory, itself created using the <a href="#">saveObject</a> method for <a href="#">SummarizedExperiment</a> objects.
metadata	Named list of metadata for this object, see <a href="#">readObjectFile</a> for details.
...	Further arguments passed to internal <a href="#">altReadObject</a> calls.

**Value**

A [SummarizedExperiment](#) object.

**Author(s)**

Aaron Lun

**See Also**

["saveObject, SummarizedExperiment-method"](#), to save the [SummarizedExperiment](#) to disk.

**Examples**

```
# Mocking up an experiment:
mat <- matrix(rpois(10000, 10), ncol=10)
colnames(mat) <- letters[1:10]
rownames(mat) <- sprintf("GENE_%i", seq_len(nrow(mat)))

se <- SummarizedExperiment(list(counts=mat))
se$stuff <- LETTERS[1:10]
rowData(se)$blah <- runif(1000)
metadata(se)$whee <- "YAY"

tmp <- tempfile()
saveObject(se, tmp)
readObject(tmp)
```

---

saveRangedSummarizedExperiment

*Save a RangedSummarizedExperiment to disk*

---

**Description**

Save a [RangedSummarizedExperiment](#) to its on-disk representation.

## Usage

```
## S4 method for signature 'RangedSummarizedExperiment'  
saveObject(x, path, ...)
```

## Arguments

x	A <a href="#">RangedSummarizedExperiment</a> object or one of its subclasses.
path	String containing the path to a directory in which to save x.
...	Further arguments to pass to " <a href="#">saveObject, SummarizedExperiment-method</a> " and internal <a href="#">altSaveObject</a> calls.

## Value

x is saved into path and NULL is invisibly returned.

## Author(s)

Aaron Lun

## See Also

[readRangedSummarizedExperiment](#), to read the RangedSummarizedExperiment back into the R session.

## Examples

```
mat <- matrix(rpois(10000, 10), ncol=10)  
colnames(mat) <- letters[1:10]  
rownames(mat) <- sprintf("GENE_%i", seq_len(nrow(mat)))  
  
gr <- GRanges("chrA", IRanges(1:1000, width=10))  
se <- SummarizedExperiment(list(counts=mat), rowRanges=gr)  
se$stuff <- LETTERS[1:10]  
rowData(se)$blah <- runif(1000)  
metadata(se)$whee <- "YAY"  
  
tmp <- tempfile()  
saveObject(se, tmp)  
list.files(tmp, recursive=TRUE)
```

---

`saveSummarizedExperiment`*Save a SummarizedExperiment to disk*

---

## Description

Save a [SummarizedExperiment](#) to its on-disk representation.

## Usage

```
## S4 method for signature 'SummarizedExperiment'  
saveObject(x, path, SummarizedExperiment.allow.dataframe.assay = FALSE, ...)
```

## Arguments

<code>x</code>	A <a href="#">SummarizedExperiment</a> object or one of its subclasses.
<code>path</code>	String containing the path to a directory in which to save <code>x</code> .
<code>SummarizedExperiment.allow.dataframe.assay</code>	Logical scalar indicating whether to allow data frames as assays of <code>x</code> .
<code>...</code>	Further arguments to pass to internal <a href="#">altSaveObject</a> calls.

## Details

By default, we consider the presence of data frames in the assays to be an error. Users should coerce these into an appropriate matrix type, e.g., a dense matrix or a sparse `dgCMatrix`. If a `DataFrame` as an assay is truly desired, users may set `options(alabaster.se.reject_data.frames=FALSE)` to skip the error. Note that this only works for [DataFrame](#) objects - `data.frame` objects will not be saved correctly.

## Value

`x` is saved into `path` and `NULL` is invisibly returned.

## Author(s)

Aaron Lun

## See Also

[readSummarizedExperiment](#), to read the `SummarizedExperiment` back into the R session.

### **Examples**

```
mat <- matrix(rpois(10000, 10), ncol=10)
colnames(mat) <- letters[1:10]
rownames(mat) <- sprintf("GENE_%i", seq_len(nrow(mat)))

se <- SummarizedExperiment(list(counts=mat))
se$stuff <- LETTERS[1:10]
rowData(se)$blah <- runif(1000)
metadata(se)$whee <- "YAY"

tmp <- tempfile()
saveObject(se, tmp)
list.files(tmp, recursive=TRUE)
```

# Index

altReadObject, [3](#), [4](#)  
altSaveObject, [5](#), [6](#)

DataFrame, [6](#)

emptyRowRanges, [2](#)

GRanges, [2](#)  
GRangesList, [2](#)

loadSummarizedExperiment  
    (readSummarizedExperiment), [3](#)

mcols, [2](#)  
metadata, [2](#)

options, [6](#)

RangedSummarizedExperiment, [2–5](#)  
readObject, [2](#), [3](#)  
readObjectFile, [3](#), [4](#)  
readRangedSummarizedExperiment, [2](#), [5](#)  
readSummarizedExperiment, [3](#), [3](#), [6](#)  
rowData, [2](#)  
rowRanges, [2](#)

saveObject, [3](#), [4](#)  
saveObject, RangedSummarizedExperiment-method  
    (saveRangedSummarizedExperiment),  
    [4](#)  
saveObject, SummarizedExperiment-method  
    (saveSummarizedExperiment), [6](#)  
saveRangedSummarizedExperiment, [4](#)  
saveSummarizedExperiment, [6](#)  
stageObject, RangedSummarizedExperiment-method  
    (saveRangedSummarizedExperiment),  
    [4](#)  
stageObject, SummarizedExperiment-method  
    (saveSummarizedExperiment), [6](#)  
SummarizedExperiment, [2–4](#), [6](#)