

# Package ‘manCTMed’

July 24, 2025

**Title** Continuous Time Mediation

**Version** 1.0.9

**Description** Research compendium for the manuscript  
Pesigan, I. J. A., Russell, M. A., & Chow, S.-M. (2025).  
Inferences and Effect Sizes for Direct, Indirect, and Total Effects  
in Continuous-Time Mediation Models.  
Psychological Methods.  
<doi:10.0000/0000000000>.

**URL** <https://github.com/jeksterslab/manCTMed>,  
<https://jeksterslab.github.io/manCTMed/>, <https://osf.io/qwnmf/>,  
<https://doi.org/10.0000/0000000000>

**BugReports** <https://github.com/jeksterslab/manCTMed/issues>

**License** MIT + file LICENSE

**Encoding** UTF-8

**LazyData** true

**LazyDataCompression** xz

**Roxygen** list(markdown = TRUE)

**Depends** R (>= 4.0.0)

**Imports** stats, dynr, OpenMx, dynUtils, simStateSpace (== 1.2.9),  
bootStateSpace (== 1.0.2), cTMed (== 1.0.6), ggplot2

**Suggests** knitr, rmarkdown, testthat, DT

**Remotes** jeksterslab/dynUtils@dc3f47b

**RoxygenNote** 7.3.2

**NeedsCompilation** no

**Author** Ivan Jacob Agaloos Pesigan [aut, cre, cph] (ORCID:  
<<https://orcid.org/0000-0003-4818-8420>>),  
Michael A. Russell [ctb] (ORCID:  
<<https://orcid.org/0000-0002-3956-604X>>),  
Sy-Miin Chow [ctb] (ORCID: <<https://orcid.org/0000-0003-1938-027X>>)

**Maintainer** Ivan Jacob Agaloos Pesigan <r.jeksterslab@gmail.com>

## Contents

BootPara . . . . .	4
BootParaStdXMY . . . . .	5
BootParaStdXYM . . . . .	6
BootParaStdYMX . . . . .	7
BootParaXMY . . . . .	8
BootParaXYM . . . . .	9
BootParaYMX . . . . .	10
Compress . . . . .	11
DeltaStdXMY . . . . .	12
DeltaStdXYM . . . . .	12
DeltaStdYMX . . . . .	13
DeltaXMY . . . . .	14
DeltaXYM . . . . .	15
DeltaYMX . . . . .	16
FigPlotEffects . . . . .	16
FigScatterPlotCoverage . . . . .	17
FigScatterPlotPower . . . . .	18
FigScatterPlotSeBias . . . . .	19
FigScatterPlotType1 . . . . .	20
FitDynr . . . . .	21
FitMx . . . . .	21
GenData . . . . .	22
IllustrationBootPara . . . . .	23
IllustrationCompress . . . . .	24
IllustrationFigPlotEffects . . . . .	25
IllustrationFigScatterPlotCoverage . . . . .	25
IllustrationFigScatterPlotPower . . . . .	26
IllustrationFigScatterPlotSeBias . . . . .	27
IllustrationFitDynr . . . . .	28
IllustrationFitMx . . . . .	28
IllustrationGenData . . . . .	29
IllustrationMCPhiSigma . . . . .	30
IllustrationPrepData . . . . .	30
illustration_dist . . . . .	31
illustration_dist_dt . . . . .	32
illustration_dist_dt_mc . . . . .	32
illustration_dist_mc . . . . .	33
illustration_dist_med . . . . .	33
illustration_dist_med_mc . . . . .	34
illustration_dist_med_std . . . . .	34
illustration_dist_med_std_mc . . . . .	35
illustration_results . . . . .	35
MCStdXMY . . . . .	37
MCStdXYM . . . . .	38
MCStdYMX . . . . .	39
MCXMY . . . . .	40

MCXYM . . . . .	41
MCYMX . . . . .	42
params . . . . .	43
PhiHat . . . . .	43
RandomMeasurement . . . . .	44
results . . . . .	45
Sim . . . . .	46
SimDynrBootPara . . . . .	47
SimDynrBootParaStdXMY . . . . .	48
SimDynrBootParaStdYMX . . . . .	49
SimDynrBootParaXMY . . . . .	50
SimDynrBootParaYMX . . . . .	51
SimDynrDeltaStdXMY . . . . .	52
SimDynrDeltaStdYMX . . . . .	53
SimDynrDeltaXMY . . . . .	54
SimDynrDeltaYMX . . . . .	55
SimDynrMCStdXMY . . . . .	56
SimDynrMCStdYMX . . . . .	57
SimDynrMCXMY . . . . .	58
SimDynrMCYMX . . . . .	59
SimFitDynr . . . . .	60
SimFitMx . . . . .	61
SimFN . . . . .	62
SimGenData . . . . .	62
SimIllustration . . . . .	63
SimIllustrationDynrBootPara . . . . .	64
SimIllustrationDynrBootParaStdXMY . . . . .	65
SimIllustrationDynrBootParaXMY . . . . .	66
SimIllustrationDynrDeltaStdXMY . . . . .	67
SimIllustrationDynrDeltaXMY . . . . .	68
SimIllustrationDynrMCPhiSigma . . . . .	69
SimIllustrationDynrMCStdXMY . . . . .	70
SimIllustrationDynrMCXMY . . . . .	71
SimIllustrationFitDynr . . . . .	72
SimIllustrationFitMx . . . . .	73
SimIllustrationGenData . . . . .	74
SimIllustrationPara . . . . .	75
SimPara . . . . .	76
SimProj . . . . .	76
Sum . . . . .	77
SumDynrDeltaStdXMY . . . . .	77
SumDynrDeltaStdYMX . . . . .	78
SumDynrDeltaXMY . . . . .	79
SumDynrDeltaYMX . . . . .	80
SumDynrMCStdXMY . . . . .	80
SumDynrMCStdYMX . . . . .	81
SumDynrMCXMY . . . . .	82
SumDynrMCYMX . . . . .	83

SumFitDynr . . . . .	83
SumIllustration . . . . .	84
SumIllustrationDynrBootParaStdXMY . . . . .	85
SumIllustrationDynrBootParaXMY . . . . .	86
SumIllustrationDynrDeltaStdXMY . . . . .	87
SumIllustrationDynrDeltaXMY . . . . .	88
SumIllustrationDynrMCStdXMY . . . . .	88
SumIllustrationDynrMCXMY . . . . .	89
SumIllustrationFitDynr . . . . .	90
ThetaHat . . . . .	91

<b>Index</b>	<b>92</b>
--------------	-----------

---

BootPara	<i>Parametric Bootstrap</i>
----------	-----------------------------

---

## Description

The function generates simulated datasets based on a fitted model and refits the model to each generated dataset using the dynr package.

## Usage

```
BootPara(
  fit,
  path,
  prefix,
  taskid,
  B = 1000L,
  ncores = NULL,
  seed = NULL,
  clean = TRUE
)
```

## Arguments

fit	R object. Output of the <code>FitDynr()</code> , <code>FitMx()</code> , <code>IllustrationFitDynr()</code> , or <code>IllustrationFitMx()</code> , functions.
path	Path to a directory to store bootstrap samples and estimates.
prefix	Character string. Prefix used for the file names for the bootstrap samples and estimates.
taskid	Positive integer. Task ID.
B	Positive integer. Number of bootstrap samples.
ncores	Positive integer. Number of cores to use.
seed	Integer. Random seed.
clean	Logical. If <code>clean = TRUE</code> , delete intermediate files generated by the function.

**See Also**

Other Confidence Interval Functions: [BootParaStdXMY\(\)](#), [BootParaStdXYM\(\)](#), [BootParaStdYMX\(\)](#), [BootParaXMY\(\)](#), [BootParaXYM\(\)](#), [BootParaYMX\(\)](#), [DeltaStdXMY\(\)](#), [DeltaStdXYM\(\)](#), [DeltaStdYMX\(\)](#), [DeltaXMY\(\)](#), [DeltaXYM\(\)](#), [DeltaYMX\(\)](#), [IllustrationBootPara\(\)](#), [MCStdXMY\(\)](#), [MCStdXYM\(\)](#), [MCStdYMX\(\)](#), [MCXMY\(\)](#), [MCXYM\(\)](#), [MCYMX\(\)](#)

**Examples**

```
## Not run:
set.seed(42)
library(dynr)
sim <- GenData(taskid = 1)
data <- RandomMeasurement(sim)
fit <- FitDynr(data, taskid = 1)
BootPara(
  fit = fit,
  path = getwd(),
  prefix = "pb",
  taskid = 1,
  B = 1000L
)

## End(Not run)
```

---

 BootParaStdXMY

---

*Parametric Bootstrap Confidence Intervals for X-M-Y (Standardized)*


---

**Description**

The function generates parametric bootstrap method confidence intervals for the mediation model  $X \rightarrow M \rightarrow Y$  (Standardized).

**Usage**

```
BootParaStdXMY(boot, theta_hat, delta_t = 1:30, ncores = NULL)
```

**Arguments**

boot	R object. Output of the <a href="#">BootPara()</a> function.
theta_hat	R object. Output of the <a href="#">ThetaHat()</a> function.
delta_t	Numeric vector. Vector of time intervals.
ncores	Positive integer. Number of cores to use.

**See Also**

Other Confidence Interval Functions: [BootPara\(\)](#), [BootParaStdXYM\(\)](#), [BootParaStdYMX\(\)](#), [BootParaXMY\(\)](#), [BootParaXYM\(\)](#), [BootParaYMX\(\)](#), [DeltaStdXMY\(\)](#), [DeltaStdXYM\(\)](#), [DeltaStdYMX\(\)](#), [DeltaXMY\(\)](#), [DeltaXYM\(\)](#), [DeltaYMX\(\)](#), [IllustrationBootPara\(\)](#), [MCStdXMY\(\)](#), [MCStdXYM\(\)](#), [MCStdYMX\(\)](#), [MCXMY\(\)](#), [MCXYM\(\)](#), [MCYMX\(\)](#)

## Examples

```
## Not run:
set.seed(42)
library(dynr)
sim <- GenData(taskid = 1)
data <- RandomMeasurement(sim)
fit <- FitDynr(data, taskid = 1)
boot <- BootPara(
  fit = fit,
  path = getwd(),
  prefix = "pb",
  taskid = 1,
  B = 1000L
)
theta_hat <- ThetaHat(fit)
ci <- BootParaStdXMY(boot = boot, theta_hat = theta_hat)
plot(ci)
plot(ci, type = "bc")

## End(Not run)
```

---

BootParaStdXYM

*Parametric Bootstrap Confidence Intervals for X-Y-M (Standardized)*

---

## Description

The function generates parametric bootstrap method confidence intervals for the mediation model  $X \rightarrow Y \rightarrow M$  (Standardized).

## Usage

```
BootParaStdXYM(boot, theta_hat, delta_t = 1:30, ncores = NULL)
```

## Arguments

boot	R object. Output of the <a href="#">BootPara()</a> function.
theta_hat	R object. Output of the <a href="#">ThetaHat()</a> function.
delta_t	Numeric vector. Vector of time intervals.
ncores	Positive integer. Number of cores to use.

## See Also

Other Confidence Interval Functions: [BootPara\(\)](#), [BootParaStdXMY\(\)](#), [BootParaStdYMX\(\)](#), [BootParaXMY\(\)](#), [BootParaXYM\(\)](#), [BootParaYMX\(\)](#), [DeltaStdXMY\(\)](#), [DeltaStdXYM\(\)](#), [DeltaStdYMX\(\)](#), [DeltaXMY\(\)](#), [DeltaXYM\(\)](#), [DeltaYMX\(\)](#), [IllustrationBootPara\(\)](#), [MCStdXMY\(\)](#), [MCStdXYM\(\)](#), [MCStdYMX\(\)](#), [MCXMY\(\)](#), [MCXYM\(\)](#), [MCYMX\(\)](#)

## Examples

```
## Not run:
set.seed(42)
library(dynr)
sim <- GenData(taskid = 1)
data <- RandomMeasurement(sim)
fit <- FitDynr(data, taskid = 1)
boot <- BootPara(
  fit = fit,
  path = getwd(),
  prefix = "pb",
  taskid = 1,
  B = 1000L
)
theta_hat <- ThetaHat(fit)
ci <- BootParaStdXYM(boot = boot, theta_hat = theta_hat)
plot(ci)
plot(ci, type = "bc")

## End(Not run)
```

---

 BootParaStdYMX

---

*Parametric Bootstrap Confidence Intervals for Y-M-X (Standardized)*


---

## Description

The function generates parametric bootstrap method confidence intervals for the mediation model  $Y \rightarrow M \rightarrow X$  (Standardized).

## Usage

```
BootParaStdYMX(boot, theta_hat, delta_t = 1:30, ncores = NULL)
```

## Arguments

boot	R object. Output of the <a href="#">BootPara()</a> function.
theta_hat	R object. Output of the <a href="#">ThetaHat()</a> function.
delta_t	Numeric vector. Vector of time intervals.
ncores	Positive integer. Number of cores to use.

## See Also

Other Confidence Interval Functions: [BootPara\(\)](#), [BootParaStdXMY\(\)](#), [BootParaStdXYM\(\)](#), [BootParaXMY\(\)](#), [BootParaXYM\(\)](#), [BootParaYMX\(\)](#), [DeltaStdXMY\(\)](#), [DeltaStdXYM\(\)](#), [DeltaStdYMX\(\)](#), [DeltaXMY\(\)](#), [DeltaXYM\(\)](#), [DeltaYMX\(\)](#), [IllustrationBootPara\(\)](#), [MCStdXMY\(\)](#), [MCStdXYM\(\)](#), [MCStdYMX\(\)](#), [MCXMY\(\)](#), [MCXYM\(\)](#), [MCYMX\(\)](#)

## Examples

```
## Not run:
set.seed(42)
library(dynr)
sim <- GenData(taskid = 1)
data <- RandomMeasurement(sim)
fit <- FitDynr(data, taskid = 1)
boot <- BootPara(
  fit = fit,
  path = getwd(),
  prefix = "pb",
  taskid = 1,
  B = 1000L
)
theta_hat <- ThetaHat(fit)
ci <- BootParaStdYMX(boot = boot, theta_hat = theta_hat)
plot(ci)
plot(ci, type = "bc")

## End(Not run)
```

---

 BootParaXMY

---

*Parametric Bootstrap Confidence Intervals for X-M-Y*


---

## Description

The function generates parametric bootstrap method confidence intervals for the mediation model  $X \rightarrow M \rightarrow Y$ .

## Usage

```
BootParaXMY(boot, phi_hat, delta_t = 1:30, ncores = NULL)
```

## Arguments

boot	R object. Output of the <a href="#">BootPara()</a> function.
phi_hat	R object. Output of the <a href="#">PhiHat()</a> function.
delta_t	Numeric vector. Vector of time intervals.
ncores	Positive integer. Number of cores to use.

## See Also

Other Confidence Interval Functions: [BootPara\(\)](#), [BootParaStdXMY\(\)](#), [BootParaStdXYM\(\)](#), [BootParaStdYMX\(\)](#), [BootParaXYM\(\)](#), [BootParaYMX\(\)](#), [DeltaStdXMY\(\)](#), [DeltaStdXYM\(\)](#), [DeltaStdYMX\(\)](#), [DeltaXMY\(\)](#), [DeltaXYM\(\)](#), [DeltaYMX\(\)](#), [IllustrationBootPara\(\)](#), [MCStdXMY\(\)](#), [MCStdXYM\(\)](#), [MCStdYMX\(\)](#), [MCXMY\(\)](#), [MCXYM\(\)](#), [MCYMX\(\)](#)



## Examples

```
## Not run:
set.seed(42)
library(dynr)
sim <- GenData(taskid = 1)
data <- RandomMeasurement(sim)
fit <- FitDynr(data, taskid = 1)
boot <- BootPara(
  fit = fit,
  path = getwd(),
  prefix = "pb",
  taskid = 1,
  B = 1000L
)
phi_hat <- PhiHat(fit)
ci <- BootParaXYM(boot = boot, phi_hat = phi_hat)
plot(ci)
plot(ci, type = "bc")

## End(Not run)
```

---

 BootParaXYM

---

*Parametric Bootstrap Confidence Intervals for X-Y-M*


---

## Description

The function generates parametric bootstrap method confidence intervals for the mediation model  $X \rightarrow Y \rightarrow M$ .

## Usage

```
BootParaXYM(boot, phi_hat, delta_t = 1:30, ncores = NULL)
```

## Arguments

boot	R object. Output of the <a href="#">BootPara()</a> function.
phi_hat	R object. Output of the <a href="#">PhiHat()</a> function.
delta_t	Numeric vector. Vector of time intervals.
ncores	Positive integer. Number of cores to use.

## See Also

Other Confidence Interval Functions: [BootPara\(\)](#), [BootParaStdXMY\(\)](#), [BootParaStdXYM\(\)](#), [BootParaStdYMX\(\)](#), [BootParaXMY\(\)](#), [BootParaYMX\(\)](#), [DeltaStdXMY\(\)](#), [DeltaStdXYM\(\)](#), [DeltaStdYMX\(\)](#), [DeltaXMY\(\)](#), [DeltaXYM\(\)](#), [DeltaYMX\(\)](#), [IllustrationBootPara\(\)](#), [MCStdXMY\(\)](#), [MCStdXYM\(\)](#), [MCStdYMX\(\)](#), [MCXMY\(\)](#), [MCXYM\(\)](#), [MCYMX\(\)](#)

## Examples

```
## Not run:
set.seed(42)
library(dynr)
sim <- GenData(taskid = 1)
data <- RandomMeasurement(sim)
fit <- FitDynr(data, taskid = 1)
boot <- BootPara(
  fit = fit,
  path = getwd(),
  prefix = "pb",
  taskid = 1,
  B = 1000L
)
phi_hat <- PhiHat(fit)
ci <- BootParaXYM(boot = boot, phi_hat = phi_hat)
plot(ci)
plot(ci, type = "bc")

## End(Not run)
```

---

 BootParaYMX

---

*Parametric Bootstrap Confidence Intervals for Y-M-X*


---

## Description

The function generates parametric bootstrap method confidence intervals for the mediation model  $Y \rightarrow M \rightarrow X$ .

## Usage

```
BootParaYMX(boot, phi_hat, delta_t = 1:30, ncores = NULL)
```

## Arguments

boot	R object. Output of the <a href="#">BootPara()</a> function.
phi_hat	R object. Output of the <a href="#">PhiHat()</a> function.
delta_t	Numeric vector. Vector of time intervals.
ncores	Positive integer. Number of cores to use.

## See Also

Other Confidence Interval Functions: [BootPara\(\)](#), [BootParaStdXMY\(\)](#), [BootParaStdXYM\(\)](#), [BootParaStdYMX\(\)](#), [BootParaXMY\(\)](#), [BootParaXYM\(\)](#), [DeltaStdXMY\(\)](#), [DeltaStdXYM\(\)](#), [DeltaStdYMX\(\)](#), [DeltaXMY\(\)](#), [DeltaXYM\(\)](#), [DeltaYMX\(\)](#), [IllustrationBootPara\(\)](#), [MCStdXMY\(\)](#), [MCStdXYM\(\)](#), [MCStdYMX\(\)](#), [MCXMY\(\)](#), [MCXYM\(\)](#), [MCYMX\(\)](#)

**Examples**

```
## Not run:
set.seed(42)
library(dynr)
sim <- GenData(taskid = 1)
data <- RandomMeasurement(sim)
fit <- FitDynr(data, taskid = 1)
boot <- BootPara(
  fit = fit,
  path = getwd(),
  prefix = "pb",
  taskid = 1,
  B = 1000L
)
phi_hat <- PhiHat(fit)
ci <- BootParaYMX(boot = boot, phi_hat = phi_hat)
plot(ci)
plot(ci, type = "bc")

## End(Not run)
```

---

Compress

---

*Compress Replication*


---

**Description**

Compress Replication

**Usage**

```
Compress(taskid, repid, output_folder)
```

**Arguments**

taskid	Positive integer. Task ID.
repid	Positive integer. Replication ID.
output_folder	Character string. Output folder.

**Value**

The output is saved as an external file in output\_folder.

**Author(s)**

Ivan Jacob Agaloos Pesigan

**See Also**

Other Compression Functions: [IllustrationCompress\(\)](#)

---

DeltaStdXMY	<i>Delta Method Confidence Intervals for X-M-Y (Standardized)</i>
-------------	---

---

**Description**

The function generates delta method confidence intervals for the mediation model  $X \rightarrow M \rightarrow Y$  (Standardized).

**Usage**

```
DeltaStdXMY(theta_hat, delta_t = 1:30)
```

**Arguments**

- theta\_hat      R object. Output of the [ThetaHat\(\)](#) function.
- delta\_t        Numeric vector. Vector of time intervals.

**See Also**

Other Confidence Interval Functions: [BootPara\(\)](#), [BootParaStdXMY\(\)](#), [BootParaStdXYM\(\)](#), [BootParaStdYMX\(\)](#), [BootParaXMY\(\)](#), [BootParaXYM\(\)](#), [BootParaYMX\(\)](#), [DeltaStdXYM\(\)](#), [DeltaStdYMX\(\)](#), [DeltaXMY\(\)](#), [DeltaXYM\(\)](#), [DeltaYMX\(\)](#), [IllustrationBootPara\(\)](#), [MCStdXMY\(\)](#), [MCStdXYM\(\)](#), [MCStdYMX\(\)](#), [MCXMY\(\)](#), [MCXYM\(\)](#), [MCYMX\(\)](#)

**Examples**

```
## Not run:
set.seed(42)
library(dynr)
sim <- GenData(taskid = 1)
data <- RandomMeasurement(sim)
fit <- FitDynr(data, taskid = 1)
theta_hat <- ThetaHat(fit)
ci <- DeltaStdXMY(theta_hat)
plot(ci)

## End(Not run)
```

---

DeltaStdXYM	<i>Delta Method Confidence Intervals for X-Y-M (Standardized)</i>
-------------	---

---

**Description**

The function generates delta method confidence intervals for the mediation model  $X \rightarrow Y \rightarrow M$  (Standardized).

**Usage**

```
DeltaStdXYM(theta_hat, delta_t = 1:30)
```

**Arguments**

theta\_hat      R object. Output of the [ThetaHat\(\)](#) function.

delta\_t        Numeric vector. Vector of time intervals.

**See Also**

Other Confidence Interval Functions: [BootPara\(\)](#), [BootParaStdXMY\(\)](#), [BootParaStdXYM\(\)](#), [BootParaStdYMX\(\)](#), [BootParaXMY\(\)](#), [BootParaXYM\(\)](#), [BootParaYMX\(\)](#), [DeltaStdXMY\(\)](#), [DeltaStdYMX\(\)](#), [DeltaXMY\(\)](#), [DeltaXYM\(\)](#), [DeltaYMX\(\)](#), [IllustrationBootPara\(\)](#), [MCStdXMY\(\)](#), [MCStdXYM\(\)](#), [MCStdYMX\(\)](#), [MCXMY\(\)](#), [MCXYM\(\)](#), [MCYMX\(\)](#)

**Examples**

```
## Not run:
set.seed(42)
library(dynr)
sim <- GenData(taskid = 1)
data <- RandomMeasurement(sim)
fit <- FitDynr(data, taskid = 1)
theta_hat <- ThetaHat(fit)
ci <- DeltaStdXYM(theta_hat)
plot(ci)

## End(Not run)
```

---

DeltaStdYMX

*Delta Method Confidence Intervals for Y-M-X (Standardized)*


---

**Description**

The function generates delta method confidence intervals for the mediation model  $Y \rightarrow M \rightarrow X$  (Standardized).

**Usage**

```
DeltaStdYMX(theta_hat, delta_t = 1:30)
```

**Arguments**

theta\_hat      R object. Output of the [ThetaHat\(\)](#) function.

delta\_t        Numeric vector. Vector of time intervals.

**See Also**

Other Confidence Interval Functions: [BootPara\(\)](#), [BootParaStdXMY\(\)](#), [BootParaStdXYM\(\)](#), [BootParaStdYMX\(\)](#), [BootParaXMY\(\)](#), [BootParaXYM\(\)](#), [BootParaYMX\(\)](#), [DeltaStdXMY\(\)](#), [DeltaStdXYM\(\)](#), [DeltaXMY\(\)](#), [DeltaXYM\(\)](#), [DeltaYMX\(\)](#), [IllustrationBootPara\(\)](#), [MCStdXMY\(\)](#), [MCStdXYM\(\)](#), [MCStdYMX\(\)](#), [MCXMY\(\)](#), [MCXYM\(\)](#), [MCYMX\(\)](#)

**Examples**

```
## Not run:
set.seed(42)
library(dynr)
sim <- GenData(taskid = 1)
data <- RandomMeasurement(sim)
fit <- FitDynr(data, taskid = 1)
theta_hat <- ThetaHat(fit)
ci <- DeltaStdYMX(theta_hat)
plot(ci)

## End(Not run)
```

DeltaXMY

*Delta Method Confidence Intervals for X-M-Y***Description**

The function generates delta method confidence intervals for the mediation model  $X \rightarrow M \rightarrow Y$ .

**Usage**

```
DeltaXMY(phi_hat, delta_t = 1:30)
```

**Arguments**

phi_hat	R object. Output of the <a href="#">PhiHat()</a> function.
delta_t	Numeric vector. Vector of time intervals.

**See Also**

Other Confidence Interval Functions: [BootPara\(\)](#), [BootParaStdXMY\(\)](#), [BootParaStdXYM\(\)](#), [BootParaStdYMX\(\)](#), [BootParaXMY\(\)](#), [BootParaXYM\(\)](#), [BootParaYMX\(\)](#), [DeltaStdXMY\(\)](#), [DeltaStdXYM\(\)](#), [DeltaStdYMX\(\)](#), [DeltaXMY\(\)](#), [DeltaXYM\(\)](#), [DeltaYMX\(\)](#), [IllustrationBootPara\(\)](#), [MCStdXMY\(\)](#), [MCStdXYM\(\)](#), [MCStdYMX\(\)](#), [MCXMY\(\)](#), [MCXYM\(\)](#), [MCYMX\(\)](#)

**Examples**

```
## Not run:
set.seed(42)
library(dynr)
sim <- GenData(taskid = 1)
data <- RandomMeasurement(sim)
fit <- FitDynr(data, taskid = 1)
phi_hat <- PhiHat(fit)
ci <- DeltaXYM(phi_hat)
plot(ci)

## End(Not run)
```

DeltaXYM

*Delta Method Confidence Intervals for X-Y-M***Description**

The function generates delta method confidence intervals for the mediation model  $X \rightarrow Y \rightarrow M$ .

**Usage**

```
DeltaXYM(phi_hat, delta_t = 1:30)
```

**Arguments**

phi_hat	R object. Output of the <a href="#">PhiHat()</a> function.
delta_t	Numeric vector. Vector of time intervals.

**See Also**

Other Confidence Interval Functions: [BootPara\(\)](#), [BootParaStdXMY\(\)](#), [BootParaStdXYM\(\)](#), [BootParaStdYMX\(\)](#), [BootParaXMY\(\)](#), [BootParaXYM\(\)](#), [BootParaYMX\(\)](#), [DeltaStdXMY\(\)](#), [DeltaStdXYM\(\)](#), [DeltaStdYMX\(\)](#), [DeltaXYM\(\)](#), [DeltaYMX\(\)](#), [IllustrationBootPara\(\)](#), [MCStdXMY\(\)](#), [MCStdXYM\(\)](#), [MCStdYMX\(\)](#), [MCXMY\(\)](#), [MCXYM\(\)](#), [MCYMX\(\)](#)

**Examples**

```
## Not run:
set.seed(42)
library(dynr)
sim <- GenData(taskid = 1)
data <- RandomMeasurement(sim)
fit <- FitDynr(data, taskid = 1)
phi_hat <- PhiHat(fit)
ci <- DeltaXYM(phi_hat)
plot(ci)

## End(Not run)
```

DeltaYMX

*Delta Method Confidence Intervals for Y-M-X***Description**

The function generates delta method confidence intervals for the mediation model  $Y \rightarrow M \rightarrow X$ .

**Usage**

```
DeltaYMX(phi_hat, delta_t = 1:30)
```

**Arguments**

phi\_hat            R object. Output of the [PhiHat\(\)](#) function.  
delta\_t            Numeric vector. Vector of time intervals.

**See Also**

Other Confidence Interval Functions: [BootPara\(\)](#), [BootParaStdXMY\(\)](#), [BootParaStdXYM\(\)](#), [BootParaStdYMX\(\)](#), [BootParaXMY\(\)](#), [BootParaXYM\(\)](#), [BootParaYMX\(\)](#), [DeltaStdXMY\(\)](#), [DeltaStdXYM\(\)](#), [DeltaStdYMX\(\)](#), [DeltaXMY\(\)](#), [DeltaXYM\(\)](#), [IllustrationBootPara\(\)](#), [MCStdXMY\(\)](#), [MCStdXYM\(\)](#), [MCStdYMX\(\)](#), [MCXMY\(\)](#), [MCXYM\(\)](#), [MCYMX\(\)](#)

**Examples**

```
## Not run:
set.seed(42)
library(dynr)
sim <- GenData(taskid = 1)
data <- RandomMeasurement(sim)
fit <- FitDynr(data, taskid = 1)
phi_hat <- PhiHat(fit)
ci <- DeltaYMX(phi_hat)
plot(ci)

## End(Not run)
```

FigPlotEffects

*Plot Total, Direct, and Indirect Effects***Description**

Effects for the model  $X \rightarrow M \rightarrow Y$ .

**Usage**

```
FigPlotEffects(dynamics = 0, std = FALSE, max_delta_t = 30, xmy = TRUE)
```



**Arguments**

dynamics	Integer. dynamics = 0 for original drift matrix, dynamics = -1 for near-neutral dynamics, and dynamics = 1 for stronger damping.
std	Logical. If std = TRUE, standardized total, direct, and indirect effects. If std = FALSE, unstandardized total, direct, and indirect effects.
max_delta_t	Numeric. Maximum time interval.
xmy	Logical. If xmy = TRUE, plot the effects for the $x \rightarrow m \rightarrow y$ mediation model. If xmy = FALSE, plot the effects for the $y \rightarrow m \rightarrow x$ mediation model.

**Author(s)**

Ivan Jacob Agaloos Pesigan

**See Also**

Other Figure Functions: [FigScatterPlotCoverage\(\)](#), [FigScatterPlotPower\(\)](#), [FigScatterPlotSeBias\(\)](#), [FigScatterPlotType1\(\)](#), [IllustrationFigPlotEffects\(\)](#), [IllustrationFigScatterPlotCoverage\(\)](#), [IllustrationFigScatterPlotPower\(\)](#), [IllustrationFigScatterPlotSeBias\(\)](#)

**Examples**

```
FigPlotEffects()
```

---

```
FigScatterPlotCoverage
```

*Plot Coverage Probabilities*

---

**Description**

Coverage probabilities for the model  $X \rightarrow M \rightarrow Y$ .

**Usage**

```
FigScatterPlotCoverage(results, delta_t = NULL, dynamics = 0, std = FALSE)
```

**Arguments**

results	Summary results data frame.
delta_t	Vector of time-interval value. If delta_t = NULL, use all available time-intervals
dynamics	Integer. dynamics = 0 for original drift matrix, dynamics = -1 for near-neutral dynamics, and dynamics = 1 for stronger damping.
std	Logical. If std = TRUE, standardized total, direct, and indirect effects. If std = FALSE, unstandardized total, direct, and indirect effects.

**Author(s)**

Ivan Jacob Agaloos Pesigan

**See Also**

Other Figure Functions: [FigPlotEffects\(\)](#), [FigScatterPlotPower\(\)](#), [FigScatterPlotSeBias\(\)](#), [FigScatterPlotType1\(\)](#), [IllustrationFigPlotEffects\(\)](#), [IllustrationFigScatterPlotCoverage\(\)](#), [IllustrationFigScatterPlotPower\(\)](#), [IllustrationFigScatterPlotSeBias\(\)](#)

**Examples**

```
data(results, package = "manCTMed")
FigScatterPlotCoverage(results)
FigScatterPlotCoverage(results, delta_t = 1:14)
FigScatterPlotCoverage(results, delta_t = 15:30)
```

---

FigScatterPlotPower      *Plot Statistical Power*

---

**Description**

Statistical power for the model  $X \rightarrow M \rightarrow Y$ .

**Usage**

```
FigScatterPlotPower(results, delta_t = NULL, dynamics = 0, std = FALSE)
```

**Arguments**

results	Summary results data frame.
delta_t	Vector of time-interval value. If delta_t = NULL, use all available time-intervals
dynamics	Integer. dynamics = 0 for original drift matrix, dynamics = -1 for near-neutral dynamics, and dynamics = 1 for stronger damping.
std	Logical. If std = TRUE, standardized total, direct, and indirect effects. If std = FALSE, unstandardized total, direct, and indirect effects.

**Author(s)**

Ivan Jacob Agaloos Pesigan

**See Also**

Other Figure Functions: [FigPlotEffects\(\)](#), [FigScatterPlotCoverage\(\)](#), [FigScatterPlotSeBias\(\)](#), [FigScatterPlotType1\(\)](#), [IllustrationFigPlotEffects\(\)](#), [IllustrationFigScatterPlotCoverage\(\)](#), [IllustrationFigScatterPlotPower\(\)](#), [IllustrationFigScatterPlotSeBias\(\)](#)

**Examples**

```
data(results, package = "manCTMed")
FigScatterPlotPower(results)
FigScatterPlotPower(results, delta_t = 1:14)
FigScatterPlotPower(results, delta_t = 15:30)
```

---

FigScatterPlotSeBias    *Plot Standard Error Bias*

---

**Description**

Standard Error Bias for the model  $X \rightarrow M \rightarrow Y$ .

**Usage**

```
FigScatterPlotSeBias(results, delta_t = NULL, dynamics = 0, std = FALSE)
```

**Arguments**

results	Summary results data frame.
delta_t	Vector of time-interval value. If delta_t = NULL, use all available time-intervals
dynamics	Integer. dynamics = 0 for original drift matrix, dynamics = -1 for near-neutral dynamics, and dynamics = 1 for stronger damping.
std	Logical. If std = TRUE, standardized total, direct, and indirect effects. If std = FALSE, unstandardized total, direct, and indirect effects.

**Author(s)**

Ivan Jacob Agaloos Pesigan

**See Also**

Other Figure Functions: [FigPlotEffects\(\)](#), [FigScatterPlotCoverage\(\)](#), [FigScatterPlotPower\(\)](#), [FigScatterPlotType1\(\)](#), [IllustrationFigPlotEffects\(\)](#), [IllustrationFigScatterPlotCoverage\(\)](#), [IllustrationFigScatterPlotPower\(\)](#), [IllustrationFigScatterPlotSeBias\(\)](#)

**Examples**

```
data(results, package = "manCTMed")
FigScatterPlotSeBias(results)
```

---

FigScatterPlotType1     *Plot Type I Error*

---

### Description

Type I error for the model  $Y \rightarrow M \rightarrow X$ .

### Usage

```
FigScatterPlotType1(results, delta_t = NULL, dynamics = 0, std = FALSE)
```

### Arguments

results	Summary results data frame.
delta_t	Vector of time-interval value. If delta_t = NULL, use all available time-intervals
dynamics	Integer. dynamics = 0 for original drift matrix, dynamics = -1 for near-neutral dynamics, and dynamics = 1 for stronger damping.
std	Logical. If std = TRUE, standardized total, direct, and indirect effects. If std = FALSE, unstandardized total, direct, and indirect effects.

### Author(s)

Ivan Jacob Agaloos Pesigan

### See Also

Other Figure Functions: [FigPlotEffects\(\)](#), [FigScatterPlotCoverage\(\)](#), [FigScatterPlotPower\(\)](#), [FigScatterPlotSeBias\(\)](#), [IllustrationFigPlotEffects\(\)](#), [IllustrationFigScatterPlotCoverage\(\)](#), [IllustrationFigScatterPlotPower\(\)](#), [IllustrationFigScatterPlotSeBias\(\)](#)

### Examples

```
data(results, package = "manCTMed")
FigScatterPlotType1(results)
FigScatterPlotType1(results, delta_t = 1:14)
FigScatterPlotType1(results, delta_t = 15:30)
```

**Description**

The function fits the model using the [dynr](#) package.

**Usage**

```
FitDynr(data, taskid)
```

**Arguments**

data	R object. Output of the <a href="#">RandomMeasurement()</a> function.
taskid	Positive integer. Task ID.

**See Also**

Other Model Fitting Functions: [FitMx\(\)](#), [IllustrationFitDynr\(\)](#), [IllustrationFitMx\(\)](#), [IllustrationMCPhiSigma\(\)](#), [IllustrationPrepData\(\)](#), [PhiHat\(\)](#), [ThetaHat\(\)](#)

**Examples**

```
## Not run:
set.seed(42)
library(dynr)
sim <- GenData(taskid = 1)
data <- RandomMeasurement(sim)
fit <- FitDynr(data, taskid = 1)
summary(fit)

## End(Not run)
```

**Description**

The function fits the model using the [OpenMx](#) package.

**Usage**

```
FitMx(data, taskid)
```

**Arguments**

`data` R object. Output of the [RandomMeasurement\(\)](#) function.  
`taskid` Positive integer. Task ID.

**See Also**

Other Model Fitting Functions: [FitDynr\(\)](#), [IllustrationFitDynr\(\)](#), [IllustrationFitMx\(\)](#), [IllustrationMCPHiSigma\(\)](#), [IllustrationPrepData\(\)](#), [PhiHat\(\)](#), [ThetaHat\(\)](#)

**Examples**

```
## Not run:
set.seed(42)
library(OpenMx)
sim <- GenData(taskid = 1)
data <- RandomMeasurement(sim)
fit <- FitMx(data, taskid = 1)
summary(fit)

## End(Not run)
```

---

GenData

---

*Simulate Data*


---

**Description**

The function simulates data using the [simStateSpace::SimSSMOUFixed\(\)](#) function.

**Usage**

```
GenData(taskid)
```

**Arguments**

`taskid` Positive integer. Task ID.

**See Also**

Other Data Generation Functions: [IllustrationGenData\(\)](#), [RandomMeasurement\(\)](#)

**Examples**

```
## Not run:
set.seed(42)
sim <- GenData(taskid = 1)
plot(sim)

## End(Not run)
```

---

IllustrationBootPara    *Parametric Bootstrap (Illustration)*


---

**Description**

The function generates simulated datasets based on a fitted model and refits the model to each generated dataset using the dynr package.

**Usage**

```
IllustrationBootPara(
  fit,
  path,
  prefix,
  taskid,
  B = 1000L,
  ncores = NULL,
  seed = NULL
)
```

**Arguments**

fit	R object. Fitted CT-VAR model.
path	Path to a directory to store bootstrap samples and estimates.
prefix	Character string. Prefix used for the file names for the bootstrap samples and estimates.
taskid	Positive integer. Task ID.
B	Positive integer. Number of bootstrap samples.
ncores	Positive integer. Number of cores to use.
seed	Integer. Random seed.

**See Also**

Other Confidence Interval Functions: [BootPara\(\)](#), [BootParaStdXMY\(\)](#), [BootParaStdXYM\(\)](#), [BootParaStdYMX\(\)](#), [BootParaXMY\(\)](#), [BootParaXYM\(\)](#), [BootParaYMX\(\)](#), [DeltaStdXMY\(\)](#), [DeltaStdXYM\(\)](#), [DeltaStdYMX\(\)](#), [DeltaXMY\(\)](#), [DeltaXYM\(\)](#), [DeltaYMX\(\)](#), [MCStdXMY\(\)](#), [MCStdXYM\(\)](#), [MCStdYMX\(\)](#), [MCXMY\(\)](#), [MCXYM\(\)](#), [MCYMX\(\)](#)

**Examples**

```
## Not run:
library(dynr)
sim <- IllustrationGenData(seed = 42)
data <- IllustrationPrepData(sim)
fit <- IllustrationFitDynr(data)
summary(fit)
```

```

IllustrationBootPara(
    fit = fit,
    path = getwd(),
    prefix = "pb",
    taskid = 1,
    B = 1000L,
    seed = 42
)

## End(Not run)

```

---

IllustrationCompress    *Compress Replication (Illustration)*

---

## Description

Compress Replication (Illustration)

## Usage

```
IllustrationCompress(taskid, repid, output_folder)
```

## Arguments

taskid	Positive integer. Task ID.
repid	Positive integer. Replication ID.
output_folder	Character string. Output folder.

## Value

The output is saved as an external file in output\_folder.

## Author(s)

Ivan Jacob Agaloos Pesigan

## See Also

Other Compression Functions: [Compress\(\)](#)



---

IllustrationFigPlotEffects

*Plot Total, Direct, and Indirect Effects (Illustration)*


---

**Description**

Effects for the model  $X \rightarrow M \rightarrow Y$ .

**Usage**

```
IllustrationFigPlotEffects(std = FALSE, max_delta_t = 30)
```

**Arguments**

std	Logical. If std = TRUE, standardized total, direct, and indirect effects. If std = FALSE, unstandardized total, direct, and indirect effects.
max_delta_t	Numeric. Maximum time interval.

**Author(s)**

Ivan Jacob Agaloos Pesigan

**See Also**

Other Figure Functions: [FigPlotEffects\(\)](#), [FigScatterPlotCoverage\(\)](#), [FigScatterPlotPower\(\)](#), [FigScatterPlotSeBias\(\)](#), [FigScatterPlotType1\(\)](#), [IllustrationFigScatterPlotCoverage\(\)](#), [IllustrationFigScatterPlotPower\(\)](#), [IllustrationFigScatterPlotSeBias\(\)](#)

**Examples**

```
IllustrationFigPlotEffects(std = FALSE)
IllustrationFigPlotEffects(std = TRUE)
```

---

IllustrationFigScatterPlotCoverage

*Illustration Plot Coverage Probabilities*


---

**Description**

Coverage probabilities for the model  $X \rightarrow M \rightarrow Y$ .

**Usage**

```
IllustrationFigScatterPlotCoverage(illustration_results)
```

**Arguments**

`illustration_results`  
Summary results data frame.

**Author(s)**

Ivan Jacob Agaloos Pesigan

**See Also**

Other Figure Functions: [FigPlotEffects\(\)](#), [FigScatterPlotCoverage\(\)](#), [FigScatterPlotPower\(\)](#), [FigScatterPlotSeBias\(\)](#), [FigScatterPlotType1\(\)](#), [IllustrationFigPlotEffects\(\)](#), [IllustrationFigScatterPlotCoverage\(\)](#), [IllustrationFigScatterPlotPower\(\)](#), [IllustrationFigScatterPlotSeBias\(\)](#)

**Examples**

```
data(illustration_results, package = "manCTMed")
IllustrationFigScatterPlotCoverage(illustration_results)
```

---

IllustrationFigScatterPlotPower

*Illustration Plot Statistical Power*

---

**Description**

Statistical Power for the model  $X \rightarrow M \rightarrow Y$ .

**Usage**

```
IllustrationFigScatterPlotPower(illustration_results)
```

**Arguments**

`illustration_results`  
Summary results data frame.

**Author(s)**

Ivan Jacob Agaloos Pesigan

**See Also**

Other Figure Functions: [FigPlotEffects\(\)](#), [FigScatterPlotCoverage\(\)](#), [FigScatterPlotPower\(\)](#), [FigScatterPlotSeBias\(\)](#), [FigScatterPlotType1\(\)](#), [IllustrationFigPlotEffects\(\)](#), [IllustrationFigScatterPlotCoverage\(\)](#), [IllustrationFigScatterPlotPower\(\)](#), [IllustrationFigScatterPlotSeBias\(\)](#)

**Examples**

```
data(illustration_results, package = "manCTMed")
IllustrationFigScatterPlotPower(illustration_results)
```

---

IllustrationFigScatterPlotSeBias

*Illustration Plot Standard Error Bias*

---

**Description**

Standard Error Bias for the model  $X \rightarrow M \rightarrow Y$ .

**Usage**

```
IllustrationFigScatterPlotSeBias(illustration_results)
```

**Arguments**

illustration\_results  
Summary results data frame.

**Author(s)**

Ivan Jacob Agaloos Pesigan

**See Also**

Other Figure Functions: [FigPlotEffects\(\)](#), [FigScatterPlotCoverage\(\)](#), [FigScatterPlotPower\(\)](#),  
[FigScatterPlotSeBias\(\)](#), [FigScatterPlotType1\(\)](#), [IllustrationFigPlotEffects\(\)](#), [IllustrationFigScatterPlotPower\(\)](#)

**Examples**

```
data(illustration_results, package = "manCTMed")
IllustrationFigScatterPlotSeBias(illustration_results)
```

---

IllustrationFitDynr	<i>Fit the Model using the dynr Package (Illustration)</i>
---------------------	--

---

**Description**

The function fits the model using the [dynr](#) package.

**Usage**

```
IllustrationFitDynr(data)
```

**Arguments**

data	R object. Output of the <a href="#">IllustrationPrepData()</a> function.
------	--

**See Also**

Other Model Fitting Functions: [FitDynr\(\)](#), [FitMx\(\)](#), [IllustrationFitMx\(\)](#), [IllustrationMCPhiSigma\(\)](#), [IllustrationPrepData\(\)](#), [PhiHat\(\)](#), [ThetaHat\(\)](#)

**Examples**

```
## Not run:
library(dynr)
sim <- IllustrationGenData(seed = 42)
data <- IllustrationPrepData(sim)
fit <- IllustrationFitDynr(data)
summary(fit)

## End(Not run)
```

---

IllustrationFitMx	<i>Fit the Model using the OpenMx Package (Illustration)</i>
-------------------	--

---

**Description**

The function fits the model using the [OpenMx](#) package.

**Usage**

```
IllustrationFitMx(data)
```

**Arguments**

data	R object. Output of the <a href="#">IllustrationPrepData()</a> function.
------	--

**See Also**

Other Model Fitting Functions: [FitDynr\(\)](#), [FitMx\(\)](#), [IllustrationFitDynr\(\)](#), [IllustrationMCPhiSigma\(\)](#), [IllustrationPrepData\(\)](#), [PhiHat\(\)](#), [ThetaHat\(\)](#)

**Examples**

```
## Not run:
library(OpenMx)
sim <- IllustrationGenData(seed = 42)
data <- IllustrationPrepData(sim)
fit <- IllustrationFitMx(data)
summary(fit)

## End(Not run)
```

---

IllustrationGenData	<i>Simulate Data (Illustration)</i>
---------------------	-------------------------------------

---

**Description**

The function simulates data using the [simStateSpace::SimSSMOUFixed\(\)](#) function.

**Usage**

```
IllustrationGenData(seed = NULL, n = 133, m = 101, delta_t_gen = 0.1)
```

**Arguments**

seed	Integer. Random seed.
n	Positive integer. Sample size.
m	Positive integer. Measurement occasions.
delta_t_gen	Numeric. Time interval used to generate data.

**See Also**

Other Data Generation Functions: [GenData\(\)](#), [RandomMeasurement\(\)](#)

**Examples**

```
## Not run:
sim <- IllustrationGenData(seed = 42)
plot(sim)

## End(Not run)
```

---

**IllustrationMCPhiSigma**

*Generate a Sampling Distribution of Drift Matrices and Process Noise Covariance Matrices (Illustration)*

---

**Description**

The function generates a sampling distribution of drift matrices and process noise covariance matrices using the Monte Carlo method.

**Usage**

```
IllustrationMCPhiSigma(fit, R = 20000L, seed = NULL)
```

**Arguments**

fit	R object. Fitted CT-VAR model.
R	Positive integer. Number of Monte Carlo replications.
seed	Integer. Random seed.

**See Also**

Other Model Fitting Functions: [FitDynr\(\)](#), [FitMx\(\)](#), [IllustrationFitDynr\(\)](#), [IllustrationFitMx\(\)](#), [IllustrationPrepData\(\)](#), [PhiHat\(\)](#), [ThetaHat\(\)](#)

**Examples**

```
## Not run:
library(dynr)
sim <- IllustrationGenData(seed = 42)
data <- IllustrationPrepData(sim)
fit <- IllustrationFitDynr(data)
IllustrationMCPhiSigma(fit, seed = 42)

## End(Not run)
```

---

**IllustrationPrepData** *Prepare Data Before Model Fitting (Illustration)*


---

**Description**

The function converts the output of [IllustrationGenData\(\)](#) into a data frame.

**Usage**

```
IllustrationPrepData(sim)
```

**Arguments**

**sim** R object. Output of the `IllustrationGenData()` function.

**See Also**

Other Model Fitting Functions: `FitDynr()`, `FitMx()`, `IllustrationFitDynr()`, `IllustrationFitMx()`, `IllustrationMCPhiSigma()`, `PhiHat()`, `ThetaHat()`

**Examples**

```
## Not run:
sim <- IllustrationGenData(seed = 42)
data <- IllustrationPrepData(sim)
head(data)
dim(data)

## End(Not run)
```

---

illustration_dist	<i>Illustration Sampling Distribution</i>
-------------------	---

---

**Description**

Illustration Sampling Distribution

**Usage**

```
data(illustration_dist)
```

**Format**

A matrix with 1000 rows and 27 columns:

**phi\_xx** Elements of the drift matrix.

**sigma\_xx** Elements of the process noise covariance matrix.

**theta\_xx** Elements of the measurement error covariance matrix.

**mu0\_x** Elements of the initial condition mean vector.

**sigma0\_xx** Elements of the initial condition covariance matrix.

**Author(s)**

Ivan Jacob Agaloos Pesigan

---

illustration\_dist\_dt    *Illustration Sampling Distribution Discrete Time - Time Interval of 1*

---

### Description

Illustration Sampling Distribution Discrete Time - Time Interval of 1

### Usage

```
data(illustration_dist_dt)
```

### Format

A matrix with 1000 rows and 15 columns:

**beta\_xx** Elements of the matrix of lagged coefficients.

**psi\_xx** Elements of the process noise covariance matrix.

### Author(s)

Ivan Jacob Agaloos Pesigan

---

illustration\_dist\_dt\_mc  
                                   *Illustration Sampling Distribution Discrete Time - Time Interval of 1*  
                                   *(Monte Carlo Method)*

---

### Description

Illustration Sampling Distribution Discrete Time - Time Interval of 1 (Monte Carlo Method)

### Usage

```
data(illustration_dist_dt_mc)
```

### Format

A matrix with 20000 rows and 15 columns:

**beta\_xx** Elements of the matrix of lagged coefficients.

**psi\_xx** Elements of the process noise covariance matrix.

### Author(s)

Ivan Jacob Agaloos Pesigan



---

illustration\_dist\_mc    *Illustration Sampling Distribution (Monte Carlo Method)*

---

**Description**

Illustration Sampling Distribution (Monte Carlo Method)

**Usage**

```
data(illustration_dist_mc)
```

**Format**

A matrix with 20000 rows and 15 columns:

**phi\_xx** Elements of the drift matrix.

**sigma\_xx** Elements of the process noise covariance matrix.

**Author(s)**

Ivan Jacob Agaloos Pesigan

---

illustration\_dist\_med    *Illustration Sampling Distribution Total, Direct, and Indirect Effects - Time Interval of 1*

---

**Description**

Illustration Sampling Distribution Total, Direct, and Indirect Effects - Time Interval of 1

**Usage**

```
data(illustration_dist_med)
```

**Format**

A matrix with 1000 rows and 27 columns:

**total** Total effect.

**direct** Direct effect.

**indirect** Indirect effect.

**Author(s)**

Ivan Jacob Agaloos Pesigan

---

```
illustration_dist_med_mc
```

*Illustration Sampling Distribution Total, Direct, and Indirect Effects -  
Time Interval of 1 (Monte Carlo Method)*

---

### Description

Illustration Sampling Distribution Total, Direct, and Indirect Effects - Time Interval of 1 (Monte Carlo Method)

### Usage

```
data(illustration_dist_med_mc)
```

### Format

A matrix with 20000 rows and 27 columns:

**total** Total effect.

**direct** Direct effect.

**indirect** Indirect effect.

### Author(s)

Ivan Jacob Agaloos Pesigan

---

```
illustration_dist_med_std
```

*Illustration Sampling Distribution Standardized Total, Direct, and In-  
direct Effects - Time Interval of 1*

---

### Description

Illustration Sampling Distribution Standardized Total, Direct, and Indirect Effects - Time Interval of 1

### Usage

```
data(illustration_dist_med_std)
```

### Format

A matrix with 1000 rows and 27 columns:

**total** Total effect.

**direct** Direct effect.

**indirect** Indirect effect.

**Author(s)**

Ivan Jacob Agaloos Pesigan

---

illustration\_dist\_med\_std\_mc

*Illustration Sampling Distribution Standardized Total, Direct, and Indirect Effects - Time Interval of 1 (Monte Carlo Method)*

---

**Description**

Illustration Sampling Distribution Standardized Total, Direct, and Indirect Effects - Time Interval of 1 (Monte Carlo Method)

**Usage**

```
data(illustration_dist_med_std_mc)
```

**Format**

A matrix with 20000 rows and 27 columns:

**total** Total effect.

**direct** Direct effect.

**indirect** Indirect effect.

**Author(s)**

Ivan Jacob Agaloos Pesigan

---

illustration\_results    *Illustration Small Scale Simulation Results*

---

**Description**

Illustration Small Scale Simulation Results

**Usage**

```
data(illustration_results)
```

**Format**

A with 22 columns:

**taskid** Task ID.

**replications** Number of replications.

**effect** Total, direct, or indirect effect.

**interval** Time interval.

**parameter** Population parameter.

**method** Method used to generate confidence intervals.

**xmy** Logical. TRUE for x to m to y path.

**std** Logical. TRUE for standardized. FALSE for unstandardized.

**est** Mean parameter estimate.

**se** Mean standard error.

**z** Mean  $z$  statistic.

**p** Mean  $p$ -value.

**R** Number of Monte Carlo or bootstrap replications.

**ll** Mean lower limit of the 95% confidence interval.

**ul** Mean upper limit of the 95% confidence interval.

**sig** Proportion of statistically significant results.

**zero\_hit** Proportion of replications where the confidence intervals included zero.

**theta\_hit** Proportion of replications where the confidence intervals included the population parameter.

**sq\_error** Mean squared error.

**se\_bias** Bias in standard error estimate.

**coverage** Coverage probability.

**power** Statistical power.

**Author(s)**

Ivan Jacob Agaloos Pesigan

MCStdXMY

*Monte Carlo Method Confidence Intervals for X-M-Y (Standardized)***Description**

The function generates Monte Carlo method confidence intervals for the mediation model  $X \rightarrow M \rightarrow Y$  (Standardized).

**Usage**

```
MCStdXMY(theta_hat, delta_t = 1:30, R = 20000L, seed = NULL)
```

**Arguments**

theta_hat	R object. Output of the <a href="#">ThetaHat()</a> function.
delta_t	Numeric vector. Vector of time intervals.
R	Positive integer. Number of Monte Carlo replications.
seed	Integer. Random seed.

**See Also**

Other Confidence Interval Functions: [BootPara\(\)](#), [BootParaStdXMY\(\)](#), [BootParaStdXYM\(\)](#), [BootParaStdYMX\(\)](#), [BootParaXMY\(\)](#), [BootParaXYM\(\)](#), [BootParaYMX\(\)](#), [DeltaStdXMY\(\)](#), [DeltaStdXYM\(\)](#), [DeltaStdYMX\(\)](#), [DeltaXMY\(\)](#), [DeltaXYM\(\)](#), [DeltaYMX\(\)](#), [IllustrationBootPara\(\)](#), [MCStdXYM\(\)](#), [MCStdYMX\(\)](#), [MCXMY\(\)](#), [MCXYM\(\)](#), [MCYMX\(\)](#)

**Examples**

```
## Not run:
set.seed(42)
library(dynr)
sim <- GenData(taskid = 1)
data <- RandomMeasurement(sim)
fit <- FitDynr(data, taskid = 1)
theta_hat <- ThetaHat(fit)
ci <- MCStdXMY(theta_hat, seed = 42)
plot(ci)

## End(Not run)
```

MCStdXYM

*Monte Carlo Method Confidence Intervals for X-Y-M (Standardized)***Description**

The function generates Monte Carlo method confidence intervals for the mediation model  $X \rightarrow Y \rightarrow M$  (Standardized).

**Usage**

```
MCStdXYM(theta_hat, delta_t = 1:30, R = 20000L, seed = NULL)
```

**Arguments**

theta_hat	R object. Output of the <a href="#">ThetaHat()</a> function.
delta_t	Numeric vector. Vector of time intervals.
R	Positive integer. Number of Monte Carlo replications.
seed	Integer. Random seed.

**See Also**

Other Confidence Interval Functions: [BootPara\(\)](#), [BootParaStdXMY\(\)](#), [BootParaStdXYM\(\)](#), [BootParaStdYMX\(\)](#), [BootParaXMY\(\)](#), [BootParaXYM\(\)](#), [BootParaYMX\(\)](#), [DeltaStdXMY\(\)](#), [DeltaStdXYM\(\)](#), [DeltaStdYMX\(\)](#), [DeltaXMY\(\)](#), [DeltaXYM\(\)](#), [DeltaYMX\(\)](#), [IllustrationBootPara\(\)](#), [MCStdXMY\(\)](#), [MCStdYMX\(\)](#), [MCXMY\(\)](#), [MCXYM\(\)](#), [MCYMX\(\)](#)

**Examples**

```
## Not run:
set.seed(42)
library(dynr)
sim <- GenData(taskid = 1)
data <- RandomMeasurement(sim)
fit <- FitDynr(data, taskid = 1)
theta_hat <- ThetaHat(fit)
ci <- MCStdXYM(theta_hat, seed = 42)
plot(ci)

## End(Not run)
```

MCStdYMX

*Monte Carlo Method Confidence Intervals for Y-M-X (Standardized)***Description**

The function generates Monte Carlo method confidence intervals for the mediation model  $Y \rightarrow M \rightarrow X$  (Standardized).

**Usage**

```
MCStdYMX(theta_hat, delta_t = 1:30, R = 20000L, seed = NULL)
```

**Arguments**

theta_hat	R object. Output of the <a href="#">ThetaHat()</a> function.
delta_t	Numeric vector. Vector of time intervals.
R	Positive integer. Number of Monte Carlo replications.
seed	Integer. Random seed.

**See Also**

Other Confidence Interval Functions: [BootPara\(\)](#), [BootParaStdXMY\(\)](#), [BootParaStdXYM\(\)](#), [BootParaStdYMX\(\)](#), [BootParaXMY\(\)](#), [BootParaXYM\(\)](#), [BootParaYMX\(\)](#), [DeltaStdXMY\(\)](#), [DeltaStdXYM\(\)](#), [DeltaStdYMX\(\)](#), [DeltaXMY\(\)](#), [DeltaXYM\(\)](#), [DeltaYMX\(\)](#), [IllustrationBootPara\(\)](#), [MCStdXMY\(\)](#), [MCStdXYM\(\)](#), [MCXMY\(\)](#), [MCXYM\(\)](#), [MCYMX\(\)](#)

**Examples**

```
## Not run:
set.seed(42)
library(dynr)
sim <- GenData(taskid = 1)
data <- RandomMeasurement(sim)
fit <- FitDynr(data, taskid = 1)
theta_hat <- ThetaHat(fit)
ci <- MCStdYMX(phi_hat, seed = 42)
plot(ci)

## End(Not run)
```

**Description**

The function generates Monte Carlo method confidence intervals for the mediation model  $X \rightarrow M \rightarrow Y$ .

**Usage**

```
MCXMY(phi_hat, delta_t = 1:30, R = 20000L, seed = NULL)
```

**Arguments**

phi_hat	R object. Output of the <a href="#">PhiHat()</a> function.
delta_t	Numeric vector. Vector of time intervals.
R	Positive integer. Number of Monte Carlo replications.
seed	Integer. Random seed.

**See Also**

Other Confidence Interval Functions: [BootPara\(\)](#), [BootParaStdXMY\(\)](#), [BootParaStdXYM\(\)](#), [BootParaStdYMX\(\)](#), [BootParaXMY\(\)](#), [BootParaXYM\(\)](#), [BootParaYMX\(\)](#), [DeltaStdXMY\(\)](#), [DeltaStdXYM\(\)](#), [DeltaStdYMX\(\)](#), [DeltaXMY\(\)](#), [DeltaXYM\(\)](#), [DeltaYMX\(\)](#), [IllustrationBootPara\(\)](#), [MCStdXMY\(\)](#), [MCStdXYM\(\)](#), [MCStdYMX\(\)](#), [MCXYM\(\)](#), [MCYMX\(\)](#)

**Examples**

```
## Not run:
set.seed(42)
library(dynr)
sim <- GenData(taskid = 1)
data <- RandomMeasurement(sim)
fit <- FitDynr(data, taskid = 1)
phi_hat <- PhiHat(fit)
ci <- MCXMY(phi_hat, seed = 42)
plot(ci)

## End(Not run)
```



**Description**

The function generates Monte Carlo method confidence intervals for the mediation model  $X \rightarrow Y \rightarrow M$ .

**Usage**

```
MCXYM(phi_hat, delta_t = 1:30, R = 20000L, seed = NULL)
```

**Arguments**

phi_hat	R object. Output of the <a href="#">PhiHat()</a> function.
delta_t	Numeric vector. Vector of time intervals.
R	Positive integer. Number of Monte Carlo replications.
seed	Integer. Random seed.

**See Also**

Other Confidence Interval Functions: [BootPara\(\)](#), [BootParaStdXMY\(\)](#), [BootParaStdXYM\(\)](#), [BootParaStdYMX\(\)](#), [BootParaXMY\(\)](#), [BootParaXYM\(\)](#), [BootParaYMX\(\)](#), [DeltaStdXMY\(\)](#), [DeltaStdXYM\(\)](#), [DeltaStdYMX\(\)](#), [DeltaXMY\(\)](#), [DeltaXYM\(\)](#), [DeltaYMX\(\)](#), [IllustrationBootPara\(\)](#), [MCStdXMY\(\)](#), [MCStdXYM\(\)](#), [MCStdYMX\(\)](#), [MCXMY\(\)](#), [MCYMX\(\)](#)

**Examples**

```
## Not run:
set.seed(42)
library(dynr)
sim <- GenData(taskid = 1)
data <- RandomMeasurement(sim)
fit <- FitDynr(data, taskid = 1)
phi_hat <- PhiHat(fit)
ci <- MCXYM(phi_hat, seed = 42)
plot(ci)

## End(Not run)
```

MCYMX

*Monte Carlo Method Confidence Intervals for Y-M-X***Description**

The function generates Monte Carlo method confidence intervals for the mediation model  $Y \rightarrow M \rightarrow X$ .

**Usage**

```
MCYMX(phi_hat, delta_t = 1:30, R = 20000L, seed = NULL)
```

**Arguments**

phi_hat	R object. Output of the <a href="#">PhiHat()</a> function.
delta_t	Numeric vector. Vector of time intervals.
R	Positive integer. Number of Monte Carlo replications.
seed	Integer. Random seed.

**See Also**

Other Confidence Interval Functions: [BootPara\(\)](#), [BootParaStdXMY\(\)](#), [BootParaStdXYM\(\)](#), [BootParaStdYMX\(\)](#), [BootParaXMY\(\)](#), [BootParaXYM\(\)](#), [BootParaYMX\(\)](#), [DeltaStdXMY\(\)](#), [DeltaStdXYM\(\)](#), [DeltaStdYMX\(\)](#), [DeltaXMY\(\)](#), [DeltaXYM\(\)](#), [DeltaYMX\(\)](#), [IllustrationBootPara\(\)](#), [MCStdXMY\(\)](#), [MCStdXYM\(\)](#), [MCStdYMX\(\)](#), [MCXMY\(\)](#), [MCXYM\(\)](#)

**Examples**

```
## Not run:
set.seed(42)
library(dynr)
sim <- GenData(taskid = 1)
data <- RandomMeasurement(sim)
fit <- FitDynr(data, taskid = 1)
phi_hat <- PhiHat(fit)
ci <- MCYMX(phi_hat, seed = 42)
plot(ci)

## End(Not run)
```

---

params	<i>Simulation Parameters</i>
--------	------------------------------

---

**Description**

Simulation Parameters

**Usage**

```
data(params)
```

**Format**

A dataframe with 30 rows and 3 columns:

**taskid** Simulation Task ID.

**n** Sample size.

**dynamics** Dynamics. 0 for original drift matrix, -1 for near-neutral dynamics, and 1 for stronger damping.

**Author(s)**

Ivan Jacob Agaloos Pesigan

---

PhiHat	<i>Estimated Drift Matrix</i>
--------	-------------------------------

---

**Description**

The function extracts the estimated drift matrix from the fitted model.

**Usage**

```
PhiHat(fit)
```

**Arguments**

**fit** R object. Output of the [FitDynr\(\)](#), [FitMx\(\)](#), [IllustrationFitDynr\(\)](#), or [IllustrationFitMx\(\)](#), functions.

**See Also**

Other Model Fitting Functions: [FitDynr\(\)](#), [FitMx\(\)](#), [IllustrationFitDynr\(\)](#), [IllustrationFitMx\(\)](#), [IllustrationMCPhiSigma\(\)](#), [IllustrationPrepData\(\)](#), [ThetaHat\(\)](#)

### Examples

```
## Not run:
set.seed(42)
library(dynr)
sim <- GenData(n = 50)
data <- RandomMeasurement(sim)
fit <- FitDynr(data)
PhiHat(fit)

## End(Not run)
```

---

RandomMeasurement	<i>Simulate Random Measurement</i>
-------------------	------------------------------------

---

### Description

The function randomly selects 100 observations from the generated data and replaces the unselected observations with NA.

### Usage

```
RandomMeasurement(sim)
```

### Arguments

`sim` R object. Output of the [GenData\(\)](#) function.

### See Also

Other Data Generation Functions: [GenData\(\)](#), [IllustrationGenData\(\)](#)

### Examples

```
## Not run:
set.seed(42)
sim <- GenData(taskid = 1)
RandomMeasurement(sim)

## End(Not run)
```

results

*Simulation Results***Description**

Simulation Results

**Usage**`data(results)`**Format**

A dataframe with 24 columns:

**taskid** Task ID.**replications** Number of replications.**effect** Total, direct, or indirect effect.**interval** Time interval.**dynamics** Dynamics. 0 for original drift matrix, -1 for near-neutral dynamics, and 1 for stronger damping.**parameter** Population parameter.**method** Method used to generate confidence intervals.**xmy** If TRUE, the mediation model is  $X \rightarrow M \rightarrow Y$ . If FALSE, the mediation model is  $Y \rightarrow M \rightarrow X$ .**std** If TRUE, standardized total, direct, and indirect effects. If FALSE, unstandardized total, direct, and indirect effects.**n** Sample size.**est** Mean parameter estimate.**se** Mean standard error.**z** Mean  $z$  statistic.**p** Mean  $p$ -value.**R** Number of Monte Carlo replications.**ll** Mean lower limit of the 95% confidence interval.**ul** Mean upper limit of the 95% confidence interval.**sig** Proportion of statistically significant results.**zero\_hit** Proportion of replications where the confidence intervals contained zero.**theta\_hit** Proportion of replications where the confidence intervals contained the population parameter.**sq\_error** Mean squared error.**se\_bias** Bias in standard error estimate.**coverage** Coverage probability.**power** Statistical power.

Author(s)

Ivan Jacob Agaloos Pesigan

---

Sim	<i>Simulation Replication</i>
-----	-------------------------------

---

Description

Simulation Replication

Usage

```
Sim(  
  taskid,  
  repid,  
  output_folder,  
  overwrite,  
  integrity,  
  seed,  
  ci,  
  pb,  
  delta_t,  
  R,  
  B  
)
```

Arguments

taskid	Positive integer. Task ID.
repid	Positive integer. Replication ID.
output_folder	Character string. Output folder.
overwrite	Logical. Overwrite existing output in output_folder.
integrity	Logical. If integrity = TRUE, check for the output file integrity when overwrite = FALSE.
seed	Integer. Random seed.
ci	Logical. Run simulations for confidence intervals.
pb	Logical. Run simulations for parametric bootstrap confidence intervals.
delta_t	Numeric vector. Vector of time intervals.
R	Positive integer. Number of Monte Carlo replications.
B	Positive integer. Number of bootstrap samples.

Value

The output is saved as an external file in output\_folder.

**Author(s)**

Ivan Jacob Agaloos Pesigan

---

SimDynrBootPara	<i>Simulation Replication - BootPara</i>
-----------------	--

---

**Description**

Simulation Replication - BootPara

**Usage**

```
SimDynrBootPara(  
  taskid,  
  repid,  
  output_folder,  
  seed,  
  suffix,  
  overwrite,  
  integrity,  
  B,  
  ncores = NULL  
)
```

**Arguments**

taskid	Positive integer. Task ID.
repid	Positive integer. Replication ID.
output_folder	Character string. Output folder.
seed	Integer. Random seed.
suffix	Character string. Output of <code>manCTMed:::SimSuffix()</code> .
overwrite	Logical. Overwrite existing output in <code>output_folder</code> .
integrity	Logical. If <code>integrity = TRUE</code> , check for the output file integrity when <code>overwrite = FALSE</code> .
B	Positive integer. Number of bootstrap samples.
ncores	Positive integer. Number of cores to use.

**Details**

This function is executed via the `Sim` function.

**Value**

The output is saved as an external file in `output_folder`.

**Author(s)**

Ivan Jacob Agaloos Pesigan

---

SimDynrBootParaStdXMY *Simulation Replication - BootParaStdXMY*

---

**Description**

Simulation Replication - BootParaStdXMY

**Usage**

```
SimDynrBootParaStdXMY(
  taskid,
  repid,
  output_folder,
  seed,
  suffix,
  overwrite,
  integrity,
  delta_t
)
```

**Arguments**

taskid	Positive integer. Task ID.
repid	Positive integer. Replication ID.
output_folder	Character string. Output folder.
seed	Integer. Random seed.
suffix	Character string. Output of <code>manCTMed:::SimSuffix()</code> .
overwrite	Logical. Overwrite existing output in <code>output_folder</code> .
integrity	Logical. If <code>integrity = TRUE</code> , check for the output file integrity when <code>overwrite = FALSE</code> .
delta_t	Numeric vector. Vector of time intervals.

**Details**

This function is executed via the `Sim` function.

**Value**

The output is saved as an external file in `output_folder`.

**Author(s)**

Ivan Jacob Agaloos Pesigan



---

**SimDynrBootParaStdYMX** *Simulation Replication - BootParaStdYMX*

---

**Description**

Simulation Replication - BootParaStdYMX

**Usage**

```
SimDynrBootParaStdYMX(  
  taskid,  
  repid,  
  output_folder,  
  seed,  
  suffix,  
  overwrite,  
  integrity,  
  delta_t  
)
```

**Arguments**

taskid	Positive integer. Task ID.
repid	Positive integer. Replication ID.
output_folder	Character string. Output folder.
seed	Integer. Random seed.
suffix	Character string. Output of <code>manCTMed:::SimSuffix()</code> .
overwrite	Logical. Overwrite existing output in <code>output_folder</code> .
integrity	Logical. If <code>integrity = TRUE</code> , check for the output file integrity when <code>overwrite = FALSE</code> .
delta_t	Numeric vector. Vector of time intervals.

**Details**

This function is executed via the `Sim` function.

**Value**

The output is saved as an external file in `output_folder`.

**Author(s)**

Ivan Jacob Agaloos Pesigan

---

SimDynrBootParaXMY      *Simulation Replication - BootParaXMY*

---

## Description

Simulation Replication - BootParaXMY

## Usage

```
SimDynrBootParaXMY(
  taskid,
  repid,
  output_folder,
  seed,
  suffix,
  overwrite,
  integrity,
  delta_t
)
```

## Arguments

taskid	Positive integer. Task ID.
repid	Positive integer. Replication ID.
output_folder	Character string. Output folder.
seed	Integer. Random seed.
suffix	Character string. Output of <code>manCTMed:::SimSuffix()</code> .
overwrite	Logical. Overwrite existing output in <code>output_folder</code> .
integrity	Logical. If <code>integrity = TRUE</code> , check for the output file integrity when <code>overwrite = FALSE</code> .
delta_t	Numeric vector. Vector of time intervals.

## Details

This function is executed via the `Sim` function.

## Value

The output is saved as an external file in `output_folder`.

## Author(s)

Ivan Jacob Agaloos Pesigan

---

SimDynrBootParaYMX      *Simulation Replication - BootParaYMX*

---

## Description

Simulation Replication - BootParaYMX

## Usage

```
SimDynrBootParaYMX(
  taskid,
  repid,
  output_folder,
  seed,
  suffix,
  overwrite,
  integrity,
  delta_t
)
```

## Arguments

taskid	Positive integer. Task ID.
repid	Positive integer. Replication ID.
output_folder	Character string. Output folder.
seed	Integer. Random seed.
suffix	Character string. Output of <code>manCTMed:::SimSuffix()</code> .
overwrite	Logical. Overwrite existing output in <code>output_folder</code> .
integrity	Logical. If <code>integrity = TRUE</code> , check for the output file integrity when <code>overwrite = FALSE</code> .
delta_t	Numeric vector. Vector of time intervals.

## Details

This function is executed via the `Sim` function.

## Value

The output is saved as an external file in `output_folder`.

## Author(s)

Ivan Jacob Agaloos Pesigan

---

SimDynrDeltaStdXMY      *Simulation Replication - DynrDeltaStdXMY*

---

## Description

Simulation Replication - DynrDeltaStdXMY

## Usage

```
SimDynrDeltaStdXMY(
  taskid,
  repid,
  output_folder,
  seed,
  suffix,
  overwrite,
  integrity,
  delta_t
)
```

## Arguments

taskid	Positive integer. Task ID.
repid	Positive integer. Replication ID.
output_folder	Character string. Output folder.
seed	Integer. Random seed.
suffix	Character string. Output of <code>manCTMed::SimSuffix()</code> .
overwrite	Logical. Overwrite existing output in <code>output_folder</code> .
integrity	Logical. If <code>integrity = TRUE</code> , check for the output file integrity when <code>overwrite = FALSE</code> .
delta_t	Numeric vector. Vector of time intervals.

## Details

This function is executed via the `Sim` function.

## Value

The output is saved as an external file in `output_folder`.

## Author(s)

Ivan Jacob Agaloos Pesigan

---

SimDynrDeltaStdYMX	<i>Simulation Replication - DynrDeltaStdYMX</i>
--------------------	---

---

**Description**

Simulation Replication - DynrDeltaStdYMX

**Usage**

```
SimDynrDeltaStdYMX(  
  taskid,  
  repid,  
  output_folder,  
  seed,  
  suffix,  
  overwrite,  
  integrity,  
  delta_t  
)
```

**Arguments**

taskid	Positive integer. Task ID.
repid	Positive integer. Replication ID.
output_folder	Character string. Output folder.
seed	Integer. Random seed.
suffix	Character string. Output of <code>manCTMed::SimSuffix()</code> .
overwrite	Logical. Overwrite existing output in <code>output_folder</code> .
integrity	Logical. If <code>integrity = TRUE</code> , check for the output file integrity when <code>overwrite = FALSE</code> .
delta_t	Numeric vector. Vector of time intervals.

**Details**

This function is executed via the `Sim` function.

**Value**

The output is saved as an external file in `output_folder`.

**Author(s)**

Ivan Jacob Agaloos Pesigan

---

SimDynrDeltaXMY

*Simulation Replication - DynrDeltaXMY*


---

## Description

Simulation Replication - DynrDeltaXMY

## Usage

```
SimDynrDeltaXMY(
  taskid,
  repid,
  output_folder,
  seed,
  suffix,
  overwrite,
  integrity,
  delta_t
)
```

## Arguments

taskid	Positive integer. Task ID.
repid	Positive integer. Replication ID.
output_folder	Character string. Output folder.
seed	Integer. Random seed.
suffix	Character string. Output of <code>manCTMed::SimSuffix()</code> .
overwrite	Logical. Overwrite existing output in <code>output_folder</code> .
integrity	Logical. If <code>integrity = TRUE</code> , check for the output file integrity when <code>overwrite = FALSE</code> .
delta_t	Numeric vector. Vector of time intervals.

## Details

This function is executed via the `Sim` function.

## Value

The output is saved as an external file in `output_folder`.

## Author(s)

Ivan Jacob Agaloos Pesigan

---

`SimDynrDeltaYMX`*Simulation Replication - DynrDeltaYMX*

---

**Description**

Simulation Replication - DynrDeltaYMX

**Usage**

```
SimDynrDeltaYMX(  
  taskid,  
  repid,  
  output_folder,  
  seed,  
  suffix,  
  overwrite,  
  integrity,  
  delta_t  
)
```

**Arguments**

<code>taskid</code>	Positive integer. Task ID.
<code>repid</code>	Positive integer. Replication ID.
<code>output_folder</code>	Character string. Output folder.
<code>seed</code>	Integer. Random seed.
<code>suffix</code>	Character string. Output of <code>manCTMed::SimSuffix()</code> .
<code>overwrite</code>	Logical. Overwrite existing output in <code>output_folder</code> .
<code>integrity</code>	Logical. If <code>integrity = TRUE</code> , check for the output file integrity when <code>overwrite = FALSE</code> .
<code>delta_t</code>	Numeric vector. Vector of time intervals.

**Details**

This function is executed via the `Sim` function.

**Value**

The output is saved as an external file in `output_folder`.

**Author(s)**

Ivan Jacob Agaloos Pesigan

---

SimDynrMCStdXMY

*Simulation Replication - DynrMCStdXMY*


---

## Description

Simulation Replication - DynrMCStdXMY

## Usage

```
SimDynrMCStdXMY(
  taskid,
  repid,
  output_folder,
  seed,
  suffix,
  overwrite,
  integrity,
  delta_t,
  R
)
```

## Arguments

taskid	Positive integer. Task ID.
repid	Positive integer. Replication ID.
output_folder	Character string. Output folder.
seed	Integer. Random seed.
suffix	Character string. Output of <code>manCTMed:::SimSuffix()</code> .
overwrite	Logical. Overwrite existing output in <code>output_folder</code> .
integrity	Logical. If <code>integrity = TRUE</code> , check for the output file integrity when <code>overwrite = FALSE</code> .
delta_t	Numeric vector. Vector of time intervals.
R	Positive integer. Number of Monte Carlo replications.

## Details

This function is executed via the `Sim` function.

## Value

The output is saved as an external file in `output_folder`.

## Author(s)

Ivan Jacob Agaloos Pesigan



---

SimDynrMCStdYMX

Simulation Replication - DynrMCStdYMX

---

**Description**

Simulation Replication - DynrMCStdYMX

**Usage**

```
SimDynrMCStdYMX(
  taskid,
  repid,
  output_folder,
  seed,
  suffix,
  overwrite,
  integrity,
  delta_t,
  R
)
```

**Arguments**

taskid	Positive integer. Task ID.
repid	Positive integer. Replication ID.
output_folder	Character string. Output folder.
seed	Integer. Random seed.
suffix	Character string. Output of <code>manCTMed:::SimSuffix()</code> .
overwrite	Logical. Overwrite existing output in <code>output_folder</code> .
integrity	Logical. If <code>integrity = TRUE</code> , check for the output file integrity when <code>overwrite = FALSE</code> .
delta_t	Numeric vector. Vector of time intervals.
R	Positive integer. Number of Monte Carlo replications.

**Details**

This function is executed via the `Sim` function.

**Value**

The output is saved as an external file in `output_folder`.

**Author(s)**

Ivan Jacob Agaloos Pesigan

---

SimDynrMCXMY

Simulation Replication - DynrMCXMY

---

## Description

Simulation Replication - DynrMCXMY

## Usage

```
SimDynrMCXMY(
  taskid,
  repid,
  output_folder,
  seed,
  suffix,
  overwrite,
  integrity,
  delta_t,
  R
)
```

## Arguments

taskid	Positive integer. Task ID.
repid	Positive integer. Replication ID.
output_folder	Character string. Output folder.
seed	Integer. Random seed.
suffix	Character string. Output of <code>manCTMed:::SimSuffix()</code> .
overwrite	Logical. Overwrite existing output in <code>output_folder</code> .
integrity	Logical. If <code>integrity = TRUE</code> , check for the output file integrity when <code>overwrite = FALSE</code> .
delta_t	Numeric vector. Vector of time intervals.
R	Positive integer. Number of Monte Carlo replications.

## Details

This function is executed via the `Sim` function.

## Value

The output is saved as an external file in `output_folder`.

## Author(s)

Ivan Jacob Agaloos Pesigan

---

SimDynrMCYMX

---

*Simulation Replication - DynrMCYMX*


---

**Description**

Simulation Replication - DynrMCYMX

**Usage**

```
SimDynrMCYMX(
  taskid,
  repid,
  output_folder,
  seed,
  suffix,
  overwrite,
  integrity,
  delta_t,
  R
)
```

**Arguments**

taskid	Positive integer. Task ID.
repid	Positive integer. Replication ID.
output_folder	Character string. Output folder.
seed	Integer. Random seed.
suffix	Character string. Output of <code>manCTMed:::SimSuffix()</code> .
overwrite	Logical. Overwrite existing output in <code>output_folder</code> .
integrity	Logical. If <code>integrity = TRUE</code> , check for the output file integrity when <code>overwrite = FALSE</code> .
delta_t	Numeric vector. Vector of time intervals.
R	Positive integer. Number of Monte Carlo replications.

**Details**

This function is executed via the `Sim` function.

**Value**

The output is saved as an external file in `output_folder`.

**Author(s)**

Ivan Jacob Agaloos Pesigan

---

`SimFitDynr`*Simulation Replication - FitDynr*

---

**Description**

Simulation Replication - FitDynr

**Usage**

```
SimFitDynr(taskid, repid, output_folder, seed, suffix, overwrite, integrity)
```

**Arguments**

<code>taskid</code>	Positive integer. Task ID.
<code>repid</code>	Positive integer. Replication ID.
<code>output_folder</code>	Character string. Output folder.
<code>seed</code>	Integer. Random seed.
<code>suffix</code>	Character string. Output of <code>manCTMed:::SimSuffix()</code> .
<code>overwrite</code>	Logical. Overwrite existing output in <code>output_folder</code> .
<code>integrity</code>	Logical. If <code>integrity = TRUE</code> , check for the output file integrity when <code>overwrite = FALSE</code> .

**Details**

This function is executed via the `Sim` function.

**Value**

The output is saved as an external file in `output_folder`.

**Author(s)**

Ivan Jacob Agaloos Pesigan

---

SimFitMx	<i>Simulation Replication - FitMx</i>
----------	---------------------------------------

---

**Description**

Simulation Replication - FitMx

**Usage**

```
SimFitMx(taskid, repid, output_folder, seed, suffix, overwrite, integrity)
```

**Arguments**

taskid	Positive integer. Task ID.
repid	Positive integer. Replication ID.
output_folder	Character string. Output folder.
seed	Integer. Random seed.
suffix	Character string. Output of <code>manCTMed:::SimSuffix()</code> .
overwrite	Logical. Overwrite existing output in <code>output_folder</code> .
integrity	Logical. If <code>integrity = TRUE</code> , check for the output file integrity when <code>overwrite = FALSE</code> .

**Details**

This function is executed via the `Sim` function.

**Value**

The output is saved as an external file in `output_folder`.

**Author(s)**

Ivan Jacob Agaloos Pesigan

---

SimFN	<i>Simulation File Name</i>
-------	-----------------------------

---

**Description**

Simulation File Name

**Usage**

SimFN(output\_type, output\_folder, suffix)

**Arguments**

- output\_type      Character string. Output type.
- output\_folder    Character string. Output folder.
- suffix            Character string. Output of manCTMed:::SimSuffix().

**Value**

Returns a character string file name with the output\_folder in the OS-specific format.

---

SimGenData	<i>Simulation Replication - GenData</i>
------------	---

---

**Description**

Simulation Replication - GenData

**Usage**

SimGenData(taskid, repid, output\_folder, seed, suffix, overwrite, integrity)

**Arguments**

- taskid            Positive integer. Task ID.
- repid            Positive integer. Replication ID.
- output\_folder    Character string. Output folder.
- seed             Integer. Random seed.
- suffix            Character string. Output of manCTMed:::SimSuffix().
- overwrite        Logical. Overwrite existing output in output\_folder.
- integrity        Logical. If integrity = TRUE, check for the output file integrity when overwrite = FALSE.

**Details**

This function is executed via the Sim function.

**Value**

The output is saved as an external file in output\_folder.

**Author(s)**

Ivan Jacob Agaloos Pesigan

---

SimIllustration	<i>Simulation Replication (Illustration)</i>
-----------------	--

---

**Description**

Simulation Replication (Illustration)

**Usage**

```
SimIllustration(  
  taskid,  
  repid,  
  output_folder,  
  overwrite,  
  integrity,  
  seed,  
  ci,  
  pb,  
  delta_t,  
  R,  
  B  
)
```

**Arguments**

- |               |   |
|---------------|---|
| taskid        | Positive integer. Task ID.  |
| repid         | Positive integer. Replication ID.   |
| output_folder | Character string. Output folder.  |
| overwrite     | Logical. Overwrite existing output in output_folder.                                      |
| integrity     | Logical. If integrity = TRUE, check for the output file integrity when overwrite = FALSE. |
| seed          | Integer. Random seed.   |
| ci            | Logical. Run simulations for confidence intervals.  |
| pb            | Logical. Run simulations for parametric bootstrap confidence intervals.                   |

delta_t	Numeric vector. Vector of time intervals.
R	Positive integer. Number of Monte Carlo replications.
B	Positive integer. Number of bootstrap samples.

**Value**

The output is saved as an external file in output\_folder.

**Author(s)**

Ivan Jacob Agaloos Pesigan

---

SimIllustrationDynrBootPara

*Simulation Replication - BootPara*

---

**Description**

Simulation Replication - BootPara

**Usage**

```
SimIllustrationDynrBootPara(
  taskid,
  repid,
  output_folder,
  seed,
  suffix,
  overwrite,
  integrity,
  B,
  ncores = NULL
)
```

**Arguments**

taskid	Positive integer. Task ID.
repid	Positive integer. Replication ID.
output_folder	Character string. Output folder.
seed	Integer. Random seed.
suffix	Character string. Output of <code>manCTMed:::SimSuffix()</code> .
overwrite	Logical. Overwrite existing output in output_folder.
integrity	Logical. If integrity = TRUE, check for the output file integrity when overwrite = FALSE.
B	Positive integer. Number of bootstrap samples.
ncores	Positive integer. Number of cores to use.



**Details**

This function is executed via the IllustrationSim function.

**Value**

The output is saved as an external file in output\_folder.

**Author(s)**

Ivan Jacob Agaloos Pesigan

---

SimIllustrationDynrBootParaStdXMY
<i>Simulation Replication - BootParaStdXMY</i>

---

**Description**

Simulation Replication - BootParaStdXMY

**Usage**

```
SimIllustrationDynrBootParaStdXMY(  
  taskid,  
  repid,  
  output_folder,  
  seed,  
  suffix,  
  overwrite,  
  integrity,  
  delta_t  
)
```

**Arguments**

taskid	Positive integer. Task ID.
repid	Positive integer. Replication ID.
output_folder	Character string. Output folder.
seed	Integer. Random seed.
suffix	Character string. Output of manCTMed:::SimSuffix().
overwrite	Logical. Overwrite existing output in output_folder.
integrity	Logical. If integrity = TRUE, check for the output file integrity when overwrite = FALSE.
delta_t	Numeric vector. Vector of time intervals.

**Details**

This function is executed via the IllustrationSim function.

**Value**

The output is saved as an external file in output\_folder.

**Author(s)**

Ivan Jacob Agaloos Pesigan

---

SimIllustrationDynrBootParaXMY
<i>Simulation Replication - BootParaXMY</i>

---

**Description**

Simulation Replication - BootParaXMY

**Usage**

```
SimIllustrationDynrBootParaXMY(  
  taskid,  
  repid,  
  output_folder,  
  seed,  
  suffix,  
  overwrite,  
  integrity,  
  delta_t  
)
```

**Arguments**

taskid	Positive integer. Task ID.
repid	Positive integer. Replication ID.
output_folder	Character string. Output folder.
seed	Integer. Random seed.
suffix	Character string. Output of manCTMed:::SimSuffix().
overwrite	Logical. Overwrite existing output in output_folder.
integrity	Logical. If integrity = TRUE, check for the output file integrity when overwrite = FALSE.
delta_t	Numeric vector. Vector of time intervals.

**Details**

This function is executed via the IllustrationSim function.

**Value**

The output is saved as an external file in output\_folder.

**Author(s)**

Ivan Jacob Agaloos Pesigan

---

SimIllustrationDynrDeltaStdXMY
<i>Simulation Replication - Illustration (DynrDeltaStdXMY)</i>

---

**Description**

Simulation Replication - Illustration (DynrDeltaStdXMY)

**Usage**

```
SimIllustrationDynrDeltaStdXMY(  
  taskid,  
  repid,  
  output_folder,  
  seed,  
  suffix,  
  overwrite,  
  integrity,  
  delta_t  
)
```

**Arguments**

taskid	Positive integer. Task ID.
repid	Positive integer. Replication ID.
output_folder	Character string. Output folder.
seed	Integer. Random seed.
suffix	Character string. Output of manCTMed:::SimSuffix().
overwrite	Logical. Overwrite existing output in output_folder.
integrity	Logical. If integrity = TRUE, check for the output file integrity when overwrite = FALSE.
delta_t	Numeric vector. Vector of time intervals.

**Details**

This function is executed via the IllustrationSim function.

**Value**

The output is saved as an external file in output\_folder.

**Author(s)**

Ivan Jacob Agaloos Pesigan

---

SimIllustrationDynrDeltaXMY

*Simulation Replication - Illustration (DynrDeltaXMY)*

---

**Description**

Simulation Replication - Illustration (DynrDeltaXMY)

**Usage**

```
SimIllustrationDynrDeltaXMY(
  taskid,
  repid,
  output_folder,
  seed,
  suffix,
  overwrite,
  integrity,
  delta_t
)
```

**Arguments**

taskid	Positive integer. Task ID.
repid	Positive integer. Replication ID.
output_folder	Character string. Output folder.
seed	Integer. Random seed.
suffix	Character string. Output of manCTMed:::SimSuffix().
overwrite	Logical. Overwrite existing output in output_folder.
integrity	Logical. If integrity = TRUE, check for the output file integrity when overwrite = FALSE.
delta_t	Numeric vector. Vector of time intervals.

**Details**

This function is executed via the IllustrationSim function.

**Value**

The output is saved as an external file in output\_folder.

**Author(s)**

Ivan Jacob Agaloos Pesigan

---

SimIllustrationDynrMCPhiSigma

*Simulation Replication - Illustration (MCPhiSigma)*

---

**Description**

Simulation Replication - Illustration (MCPhiSigma)

**Usage**

```
SimIllustrationDynrMCPhiSigma(
  taskid,
  repid,
  output_folder,
  seed,
  suffix,
  overwrite,
  integrity,
  R
)
```

**Arguments**

taskid	Positive integer. Task ID.
repid	Positive integer. Replication ID.
output_folder	Character string. Output folder.
seed	Integer. Random seed.
suffix	Character string. Output of manCTMed:::SimSuffix().
overwrite	Logical. Overwrite existing output in output_folder.
integrity	Logical. If integrity = TRUE, check for the output file integrity when overwrite = FALSE.
R	Positive integer. Number of Monte Carlo replications.

**Details**

This function is executed via the IllustrationSim function.

**Value**

The output is saved as an external file in output\_folder.

**Author(s)**

Ivan Jacob Agaloos Pesigan

---

SimIllustrationDynrMCStdXMY

*Simulation Replication - Illustration (DynrMCStdXMY)*

---

**Description**

Simulation Replication - Illustration (DynrMCStdXMY)

**Usage**

```
SimIllustrationDynrMCStdXMY(
  taskid,
  repid,
  output_folder,
  seed,
  suffix,
  overwrite,
  integrity,
  delta_t,
  R
)
```

**Arguments**

taskid	Positive integer. Task ID.
repid	Positive integer. Replication ID.
output_folder	Character string. Output folder.
seed	Integer. Random seed.
suffix	Character string. Output of manCTMed:::SimSuffix().
overwrite	Logical. Overwrite existing output in output_folder.
integrity	Logical. If integrity = TRUE, check for the output file integrity when overwrite = FALSE.
delta_t	Numeric vector. Vector of time intervals.
R	Positive integer. Number of Monte Carlo replications.

**Details**

This function is executed via the IllustrationSim function.

**Value**

The output is saved as an external file in output\_folder.

**Author(s)**

Ivan Jacob Agaloos Pesigan

---

SimIllustrationDynrMCXMY

*Simulation Replication - Illustration (DynrMCXMY)*

---

**Description**

Simulation Replication - Illustration (DynrMCXMY)

**Usage**

```
SimIllustrationDynrMCXMY(
  taskid,
  repid,
  output_folder,
  seed,
  suffix,
  overwrite,
  integrity,
  delta_t,
  R
)
```

**Arguments**

taskid	Positive integer. Task ID.
repid	Positive integer. Replication ID.
output_folder	Character string. Output folder.
seed	Integer. Random seed.
suffix	Character string. Output of manCTMed:::SimSuffix().
overwrite	Logical. Overwrite existing output in output_folder.
integrity	Logical. If integrity = TRUE, check for the output file integrity when overwrite = FALSE.
delta_t	Numeric vector. Vector of time intervals.
R	Positive integer. Number of Monte Carlo replications.

**Details**

This function is executed via the `IllustrationSim` function.

**Value**

The output is saved as an external file in `output_folder`.

**Author(s)**

Ivan Jacob Agaloos Pesigan

---

`SimIllustrationFitDynr`

*Simulation Replication - IllustrationFitDynr*

---

**Description**

Simulation Replication - IllustrationFitDynr

**Usage**

```
SimIllustrationFitDynr(
  taskid,
  repid,
  output_folder,
  seed,
  suffix,
  overwrite,
  integrity
)
```

**Arguments**

<code>taskid</code>	Positive integer. Task ID.
<code>repid</code>	Positive integer. Replication ID.
<code>output_folder</code>	Character string. Output folder.
<code>seed</code>	Integer. Random seed.
<code>suffix</code>	Character string. Output of <code>manCTMed:::SimSuffix()</code> .
<code>overwrite</code>	Logical. Overwrite existing output in <code>output_folder</code> .
<code>integrity</code>	Logical. If <code>integrity = TRUE</code> , check for the output file integrity when <code>overwrite = FALSE</code> .

**Details**

This function is executed via the `IllustrationSim` function.



**Value**

The output is saved as an external file in output\_folder.

**Author(s)**

Ivan Jacob Agaloos Pesigan

---

SimIllustrationFitMx    *Simulation Replication - IllustrationFitMx*

---

**Description**

Simulation Replication - IllustrationFitMx

**Usage**

```
SimIllustrationFitMx(
  taskid,
  repid,
  output_folder,
  seed,
  suffix,
  overwrite,
  integrity
)
```

**Arguments**

taskid	Positive integer. Task ID.
repid	Positive integer. Replication ID.
output_folder	Character string. Output folder.
seed	Integer. Random seed.
suffix	Character string. Output of <code>manCTMed:::SimSuffix()</code> .
overwrite	Logical. Overwrite existing output in output_folder.
integrity	Logical. If integrity = TRUE, check for the output file integrity when overwrite = FALSE.

**Details**

This function is executed via the `IllustrationSim` function.

**Value**

The output is saved as an external file in output\_folder.

**Author(s)**

Ivan Jacob Agaloos Pesigan

---

SimIllustrationGenData

*Simulation Replication - IllustrationGenData*

---

**Description**

Simulation Replication - IllustrationGenData

**Usage**

```
SimIllustrationGenData(
  taskid,
  repid,
  output_folder,
  seed,
  suffix,
  overwrite,
  integrity
)
```

**Arguments**

taskid	Positive integer. Task ID.
repid	Positive integer. Replication ID.
output_folder	Character string. Output folder.
seed	Integer. Random seed.
suffix	Character string. Output of <code>manCTMed:::SimSuffix()</code> .
overwrite	Logical. Overwrite existing output in <code>output_folder</code> .
integrity	Logical. If <code>integrity = TRUE</code> , check for the output file integrity when <code>overwrite = FALSE</code> .

**Details**

This function is executed via the `IllustrationSim` function.

**Value**

The output is saved as an external file in `output_folder`.

**Author(s)**

Ivan Jacob Agaloos Pesigan

---

SimIllustrationPara	<i>Simulation Replication Parametric Bootstrap (Parallel)</i>
---------------------	---

---

**Description**

Simulation Replication Parametric Bootstrap (Parallel)

**Usage**

```
SimIllustrationPara(  
  taskid,  
  repid,  
  output_folder,  
  overwrite,  
  integrity,  
  seed,  
  B  
)
```

**Arguments**

taskid	Positive integer. Task ID.
repid	Positive integer. Replication ID.
output_folder	Character string. Output folder.
overwrite	Logical. Overwrite existing output in output_folder.
integrity	Logical. If integrity = TRUE, check for the output file integrity when overwrite = FALSE.
seed	Integer. Random seed.
B	Positive integer. Number of bootstrap samples.

**Value**

The output is saved as an external file in output\_folder.

**Author(s)**

Ivan Jacob Agaloos Pesigan

---

SimPara

*Simulation Replication Parametric Bootstrap (Parallel)*


---

**Description**

Simulation Replication Parametric Bootstrap (Parallel)

**Usage**

SimPara(taskid, repid, output\_folder, overwrite, integrity, seed, B)

**Arguments**

taskid	Positive integer. Task ID.
repid	Positive integer. Replication ID.
output_folder	Character string. Output folder.
overwrite	Logical. Overwrite existing output in output_folder.
integrity	Logical. If integrity = TRUE, check for the output file integrity when overwrite = FALSE.
seed	Integer. Random seed.
B	Positive integer. Number of bootstrap samples.

**Value**

The output is saved as an external file in output\_folder.

**Author(s)**

Ivan Jacob Agaloos Pesigan

---

SimProj

*Simulation Project Name*


---

**Description**

Simulation Project Name

**Usage**

SimProj()

**Value**

Returns the project name as a character string.

**Author(s)**

Ivan Jacob Agaloos Pesigan

---

Sum	<i>Summary</i>
-----	----------------

---

**Description**

Summary

**Usage**

Sum(taskid, reps, output\_folder, overwrite, integrity)

**Arguments**

taskid	Positive integer. Task ID.
reps	Positive integer. Number of replications.
output_folder	Character string. Output folder.
overwrite	Logical. Overwrite existing output in output_folder.
integrity	Logical. If integrity = TRUE, check for the output file integrity when overwrite = FALSE.

**Value**

The output is saved as an external file in output\_folder.

**Author(s)**

Ivan Jacob Agaloos Pesigan

---

SumDynrDeltaStdXMY	<i>Summary (DynrDeltaStdXMY)</i>
--------------------	----------------------------------

---

**Description**

Summary (DynrDeltaStdXMY)

**Usage**

SumDynrDeltaStdXMY(taskid, reps, output\_folder, overwrite, integrity)

**Arguments**

taskid	Positive integer. Task ID.
reps	Positive integer. Number of replications.
output_folder	Character string. Output folder.
overwrite	Logical. Overwrite existing output in output_folder.
integrity	Logical. If integrity = TRUE, check for the output file integrity when overwrite = FALSE.

**Details**

This function is executed via the Sum function.

**Value**

The output is saved as an external file in output\_folder.

**Author(s)**

Ivan Jacob Agaloos Pesigan

---

SumDynrDeltaStdYMX	<i>Summary (DynrDeltaStdYMX)</i>
--------------------	----------------------------------

---

**Description**

Summary (DynrDeltaStdYMX)

**Usage**

SumDynrDeltaStdYMX(taskid, reps, output\_folder, overwrite, integrity)

**Arguments**

taskid	Positive integer. Task ID.
reps	Positive integer. Number of replications.
output_folder	Character string. Output folder.
overwrite	Logical. Overwrite existing output in output_folder.
integrity	Logical. If integrity = TRUE, check for the output file integrity when overwrite = FALSE.

**Details**

This function is executed via the Sum function.

**Value**

The output is saved as an external file in output\_folder.

**Author(s)**

Ivan Jacob Agaloos Pesigan

---

SumDynrDeltaXMY	<i>Summary (DynrDeltaXMY)</i>
-----------------	-------------------------------

---

**Description**

Summary (DynrDeltaXMY)

**Usage**

SumDynrDeltaXMY(taskid, reps, output\_folder, overwrite, integrity)

**Arguments**

taskid	Positive integer. Task ID.
reps	Positive integer. Number of replications.
output_folder	Character string. Output folder.
overwrite	Logical. Overwrite existing output in output_folder.
integrity	Logical. If integrity = TRUE, check for the output file integrity when overwrite = FALSE.

**Details**

This function is executed via the Sum function.

**Value**

The output is saved as an external file in output\_folder.

**Author(s)**

Ivan Jacob Agaloos Pesigan

---

SumDynrDeltaYMX	<i>Summary (DynrDeltaYMX)</i>
-----------------	-------------------------------

---

**Description**

Summary (DynrDeltaYMX)

**Usage**

SumDynrDeltaYMX(taskid, reps, output\_folder, overwrite, integrity)

**Arguments**

- taskid            Positive integer. Task ID.
- reps            Positive integer. Number of replications.
- output\_folder   Character string. Output folder.
- overwrite       Logical. Overwrite existing output in output\_folder.
- integrity       Logical. If integrity = TRUE, check for the output file integrity when overwrite = FALSE.

**Details**

This function is executed via the Sum function.

**Value**

The output is saved as an external file in output\_folder.

**Author(s)**

Ivan Jacob Agaloos Pesigan

---

SumDynrMCStdXMY	<i>Summary (DynrMCStdXMY)</i>
-----------------	-------------------------------

---

**Description**

Summary (DynrMCStdXMY)

**Usage**

SumDynrMCStdXMY(taskid, reps, output\_folder, overwrite, integrity)



**Arguments**

taskid	Positive integer. Task ID.
reps	Positive integer. Number of replications.
output_folder	Character string. Output folder.
overwrite	Logical. Overwrite existing output in output_folder.
integrity	Logical. If integrity = TRUE, check for the output file integrity when overwrite = FALSE.

**Details**

This function is executed via the Sum function.

**Value**

The output is saved as an external file in output\_folder.

**Author(s)**

Ivan Jacob Agaloos Pesigan

---

SumDynrMCStdYMX	<i>Summary (DynrMCStdYMX)</i>
-----------------	-------------------------------

---

**Description**

Summary (DynrMCStdYMX)

**Usage**

SumDynrMCStdYMX(taskid, reps, output\_folder, overwrite, integrity)

**Arguments**

taskid	Positive integer. Task ID.
reps	Positive integer. Number of replications.
output_folder	Character string. Output folder.
overwrite	Logical. Overwrite existing output in output_folder.
integrity	Logical. If integrity = TRUE, check for the output file integrity when overwrite = FALSE.

**Details**

This function is executed via the Sum function.

**Value**

The output is saved as an external file in output\_folder.

**Author(s)**

Ivan Jacob Agaloos Pesigan

---

SumDynrMCXMY	<i>Summary (DynrMCXMY)</i>
--------------	----------------------------

---

**Description**

Summary (DynrMCXMY)

**Usage**

SumDynrMCXMY(taskid, reps, output\_folder, overwrite, integrity)

**Arguments**

- |               |   |
|---------------|---|
| taskid        | Positive integer. Task ID.  |
| reps          | Positive integer. Number of replications.   |
| output_folder | Character string. Output folder.  |
| overwrite     | Logical. Overwrite existing output in output_folder.                                      |
| integrity     | Logical. If integrity = TRUE, check for the output file integrity when overwrite = FALSE. |

**Details**

This function is executed via the Sum function.

**Value**

The output is saved as an external file in output\_folder.

**Author(s)**

Ivan Jacob Agaloos Pesigan

---

SumDynrMCYMX	<i>Summary (DynrMCYMX)</i>
--------------	----------------------------

---

**Description**

Summary (DynrMCYMX)

**Usage**

SumDynrMCYMX(taskid, reps, output\_folder, overwrite, integrity)

**Arguments**

- taskid            Positive integer. Task ID.
- reps             Positive integer. Number of replications.
- output\_folder   Character string. Output folder.
- overwrite       Logical. Overwrite existing output in output\_folder.
- integrity       Logical. If integrity = TRUE, check for the output file integrity when overwrite = FALSE.

**Details**

This function is executed via the Sum function.

**Value**

The output is saved as an external file in output\_folder.

**Author(s)**

Ivan Jacob Agaloos Pesigan

---

SumFitDynr	<i>Summary (FitDynr)</i>
------------	--------------------------

---

**Description**

Summary (FitDynr)

**Usage**

SumFitDynr(taskid, reps, output\_folder, overwrite, integrity)

**Arguments**

taskid	Positive integer. Task ID.
reps	Positive integer. Number of replications.
output_folder	Character string. Output folder.
overwrite	Logical. Overwrite existing output in output_folder.
integrity	Logical. If integrity = TRUE, check for the output file integrity when overwrite = FALSE.

**Details**

This function is executed via the Sum function.

**Value**

The output is saved as an external file in output\_folder.

**Author(s)**

Ivan Jacob Agaloos Pesigan

---

SumIllustration	<i>Summary (Illustration)</i>
-----------------	-------------------------------

---

**Description**

Summary (Illustration)

**Usage**

SumIllustration(taskid, reps, output\_folder, overwrite, integrity)

**Arguments**

taskid	Positive integer. Task ID.
reps	Positive integer. Number of replications.
output_folder	Character string. Output folder.
overwrite	Logical. Overwrite existing output in output_folder.
integrity	Logical. If integrity = TRUE, check for the output file integrity when overwrite = FALSE.

**Value**

The output is saved as an external file in output\_folder.

**Author(s)**

Ivan Jacob Agaloos Pesigan

---

SumIllustrationDynrBootParaStdXMY
<i>Summary - Illustration (DynrBootParaStdXMY)</i>

---

**Description**

Summary - Illustration (DynrBootParaStdXMY)

**Usage**

```
SumIllustrationDynrBootParaStdXMY(  
  taskid,  
  reps,  
  output_folder,  
  overwrite,  
  integrity,  
  type = "pc"  
)
```

**Arguments**

taskid	Positive integer. Task ID.
reps	Positive integer. Number of replications.
output_folder	Character string. Output folder.
overwrite	Logical. Overwrite existing output in output_folder.
integrity	Logical. If integrity = TRUE, check for the output file integrity when overwrite = FALSE.
type	Character string. Confidence interval type.

**Details**

This function is executed via the IllustrationSum function.

**Value**

The output is saved as an external file in output\_folder.

**Author(s)**

Ivan Jacob Agaloos Pesigan

---

SumIllustrationDynrBootParaXMY
<i>Summary - Illustration (DynrBootParaXMY)</i>

---

**Description**

Summary - Illustration (DynrBootParaXMY)

**Usage**

```
SumIllustrationDynrBootParaXMY(  
  taskid,  
  reps,  
  output_folder,  
  overwrite,  
  integrity,  
  type = "pc"  
)
```

**Arguments**

taskid	Positive integer. Task ID.
reps	Positive integer. Number of replications.
output_folder	Character string. Output folder.
overwrite	Logical. Overwrite existing output in output_folder.
integrity	Logical. If integrity = TRUE, check for the output file integrity when overwrite = FALSE.
type	Character string. Confidence interval type.

**Details**

This function is executed via the IllustrationSum function.

**Value**

The output is saved as an external file in output\_folder.

**Author(s)**

Ivan Jacob Agaloos Pesigan

---

SumIllustrationDynrDeltaStdXMY
<i>Summary - Illustration (DynrDeltaStdXMY)</i>

---

**Description**

Summary - Illustration (DynrDeltaStdXMY)

**Usage**

```
SumIllustrationDynrDeltaStdXMY(  
    taskid,  
    reps,  
    output_folder,  
    overwrite,  
    integrity  
)
```

**Arguments**

taskid	Positive integer. Task ID.
reps	Positive integer. Number of replications.
output_folder	Character string. Output folder.
overwrite	Logical. Overwrite existing output in output_folder.
integrity	Logical. If integrity = TRUE, check for the output file integrity when overwrite = FALSE.

**Details**

This function is executed via the IllustrationSum function.

**Value**

The output is saved as an external file in output\_folder.

**Author(s)**

Ivan Jacob Agaloos Pesigan

---

SumIllustrationDynrDeltaXMY
<i>Summary - Illustration (DynrDeltaXMY)</i>

---

**Description**

Summary - Illustration (DynrDeltaXMY)

**Usage**

SumIllustrationDynrDeltaXMY(taskid, reps, output\_folder, overwrite, integrity)

**Arguments**

taskid	Positive integer. Task ID.
reps	Positive integer. Number of replications.
output_folder	Character string. Output folder.
overwrite	Logical. Overwrite existing output in output_folder.
integrity	Logical. If integrity = TRUE, check for the output file integrity when overwrite = FALSE.

**Details**

This function is executed via the IllustrationSum function.

**Value**

The output is saved as an external file in output\_folder.

**Author(s)**

Ivan Jacob Agaloos Pesigan

---

SumIllustrationDynrMCStdXMY
<i>Summary - Illustration (DynrMCStdXMY)</i>

---

**Description**

Summary - Illustration (DynrMCStdXMY)

**Usage**

SumIllustrationDynrMCStdXMY(taskid, reps, output\_folder, overwrite, integrity)



**Arguments**

taskid	Positive integer. Task ID.
reps	Positive integer. Number of replications.
output_folder	Character string. Output folder.
overwrite	Logical. Overwrite existing output in output_folder.
integrity	Logical. If integrity = TRUE, check for the output file integrity when overwrite = FALSE.

**Details**

This function is executed via the IllustrationSum function.

**Value**

The output is saved as an external file in output\_folder.

**Author(s)**

Ivan Jacob Agaloos Pesigan

---

SumIllustrationDynrMCXMY

*Summary - Illustration (DynrMCXMY)*

---

**Description**

Summary - Illustration (DynrMCXMY)

**Usage**

```
SumIllustrationDynrMCXMY(taskid, reps, output_folder, overwrite, integrity)
```

**Arguments**

taskid	Positive integer. Task ID.
reps	Positive integer. Number of replications.
output_folder	Character string. Output folder.
overwrite	Logical. Overwrite existing output in output_folder.
integrity	Logical. If integrity = TRUE, check for the output file integrity when overwrite = FALSE.

**Details**

This function is executed via the IllustrationSum function.

**Value**

The output is saved as an external file in output\_folder.

**Author(s)**

Ivan Jacob Agaloos Pesigan

---

SumIllustrationFitDynr
<i>Summary - Illustration (FitDynr)</i>

---

**Description**

Summary - Illustration (FitDynr)

**Usage**

SumIllustrationFitDynr(taskid, reps, output\_folder, overwrite, integrity)

**Arguments**

taskid	Positive integer. Task ID.
reps	Positive integer. Number of replications.
output_folder	Character string. Output folder.
overwrite	Logical. Overwrite existing output in output_folder.
integrity	Logical. If integrity = TRUE, check for the output file integrity when overwrite = FALSE.

**Details**

This function is executed via the IllustrationSum function.

**Value**

The output is saved as an external file in output\_folder.

**Author(s)**

Ivan Jacob Agaloos Pesigan

---

ThetaHat

---

*Estimated Drift Matrix and Process Noise*

---

**Description**

The function extracts the estimated drift matrix and process noise from the fitted model.

**Usage**

```
ThetaHat(fit)
```

**Arguments**

`fit` R object. Output of the [FitDynr\(\)](#), [FitMx\(\)](#), [IllustrationFitDynr\(\)](#), or [IllustrationFitMx\(\)](#), functions.

**See Also**

Other Model Fitting Functions: [FitDynr\(\)](#), [FitMx\(\)](#), [IllustrationFitDynr\(\)](#), [IllustrationFitMx\(\)](#), [IllustrationMCPhiSigma\(\)](#), [IllustrationPrepData\(\)](#), [PhiHat\(\)](#)

**Examples**

```
## Not run:
set.seed(42)
library(dynr)
sim <- GenData(n = 50)
data <- RandomMeasurement(sim)
fit <- FitDynr(data)
ThetaHat(fit)

## End(Not run)
```

# Index

## \* Compression Functions

Compress, [11](#)  
IllustrationCompress, [24](#)

## \* Confidence Interval Functions

BootPara, [4](#)  
BootParaStdXMY, [5](#)  
BootParaStdXYM, [6](#)  
BootParaStdYMX, [7](#)  
BootParaXMY, [8](#)  
BootParaXYM, [9](#)  
BootParaYMX, [10](#)  
DeltaStdXMY, [12](#)  
DeltaStdXYM, [12](#)  
DeltaStdYMX, [13](#)  
DeltaXMY, [14](#)  
DeltaXYM, [15](#)  
DeltaYMX, [16](#)  
IllustrationBootPara, [23](#)  
MCStdXMY, [37](#)  
MCStdXYM, [38](#)  
MCStdYMX, [39](#)  
MCXMY, [40](#)  
MCXYM, [41](#)  
MCYMX, [42](#)

## \* Data Generation Functions

GenData, [22](#)  
IllustrationGenData, [29](#)  
RandomMeasurement, [44](#)

## \* Figure Functions

FigPlotEffects, [16](#)  
FigScatterPlotCoverage, [17](#)  
FigScatterPlotPower, [18](#)  
FigScatterPlotSeBias, [19](#)  
FigScatterPlotType1, [20](#)  
IllustrationFigPlotEffects, [25](#)  
IllustrationFigScatterPlotCoverage, [25](#)  
IllustrationFigScatterPlotPower, [26](#)

IllustrationFigScatterPlotSeBias, [27](#)

## \* Model Fitting Functions

FitDynr, [21](#)  
FitMx, [21](#)  
IllustrationFitDynr, [28](#)  
IllustrationFitMx, [28](#)  
IllustrationMCPhiSigma, [30](#)  
IllustrationPrepData, [30](#)  
PhiHat, [43](#)  
ThetaHat, [91](#)

## \* ci

BootPara, [4](#)  
BootParaStdXMY, [5](#)  
BootParaStdXYM, [6](#)  
BootParaStdYMX, [7](#)  
BootParaXMY, [8](#)  
BootParaXYM, [9](#)  
BootParaYMX, [10](#)  
DeltaStdXMY, [12](#)  
DeltaStdXYM, [12](#)  
DeltaStdYMX, [13](#)  
DeltaXMY, [14](#)  
DeltaXYM, [15](#)  
DeltaYMX, [16](#)  
IllustrationBootPara, [23](#)  
IllustrationMCPhiSigma, [30](#)  
MCStdXMY, [37](#)  
MCStdXYM, [38](#)  
MCStdYMX, [39](#)  
MCXMY, [40](#)  
MCXYM, [41](#)  
MCYMX, [42](#)  
PhiHat, [43](#)  
SimDynrBootPara, [47](#)  
SimDynrBootParaStdXMY, [48](#)  
SimDynrBootParaStdYMX, [49](#)  
SimDynrBootParaXMY, [50](#)  
SimDynrBootParaYMX, [51](#)

- SimDynrDeltaStdXMY, [52](#)
- SimDynrDeltaStdYMX, [53](#)
- SimDynrDeltaXMY, [54](#)
- SimDynrDeltaYMX, [55](#)
- SimDynrMCStdXMY, [56](#)
- SimDynrMCStdYMX, [57](#)
- SimDynrMCXMY, [58](#)
- SimDynrMCYMX, [59](#)
- SimIllustrationDynrBootPara, [64](#)
- SimIllustrationDynrBootParaStdXMY, [65](#)
- SimIllustrationDynrBootParaXMY, [66](#)
- SimIllustrationDynrDeltaStdXMY, [67](#)
- SimIllustrationDynrDeltaXMY, [68](#)
- SimIllustrationDynrMCPhiSigma, [69](#)
- SimIllustrationDynrMCStdXMY, [70](#)
- SimIllustrationDynrMCXMY, [71](#)
- ThetaHat, [91](#)
- \* **compress**
  - Compress, [11](#)
  - IllustrationCompress, [24](#)
- \* **data**
  - illustration\_dist, [31](#)
  - illustration\_dist\_dt, [32](#)
  - illustration\_dist\_dt\_mc, [32](#)
  - illustration\_dist\_mc, [33](#)
  - illustration\_dist\_med, [33](#)
  - illustration\_dist\_med\_mc, [34](#)
  - illustration\_dist\_med\_std, [34](#)
  - illustration\_dist\_med\_std\_mc, [35](#)
  - illustration\_results, [35](#)
  - params, [43](#)
  - results, [45](#)
- \* **figure**
  - FigPlotEffects, [16](#)
  - FigScatterPlotCoverage, [17](#)
  - FigScatterPlotPower, [18](#)
  - FigScatterPlotSeBias, [19](#)
  - FigScatterPlotType1, [20](#)
  - IllustrationFigPlotEffects, [25](#)
  - IllustrationFigScatterPlotCoverage, [25](#)
  - IllustrationFigScatterPlotPower, [26](#)
  - IllustrationFigScatterPlotSeBias, [27](#)
- \* **fit**
  - FitDynr, [21](#)
  - FitMx, [21](#)
  - IllustrationFitDynr, [28](#)
  - IllustrationFitMx, [28](#)
  - SimFitDynr, [60](#)
  - SimFitMx, [61](#)
  - SimIllustrationFitDynr, [72](#)
  - SimIllustrationFitMx, [73](#)
- \* **gendata**
  - GenData, [22](#)
  - IllustrationGenData, [29](#)
  - IllustrationPrepData, [30](#)
  - RandomMeasurement, [44](#)
  - SimGenData, [62](#)
  - SimIllustrationGenData, [74](#)
- \* **illustration**
  - illustration\_dist, [31](#)
  - illustration\_dist\_dt, [32](#)
  - illustration\_dist\_dt\_mc, [32](#)
  - illustration\_dist\_mc, [33](#)
  - illustration\_dist\_med, [33](#)
  - illustration\_dist\_med\_mc, [34](#)
  - illustration\_dist\_med\_std, [34](#)
  - illustration\_dist\_med\_std\_mc, [35](#)
  - illustration\_results, [35](#)
  - IllustrationBootPara, [23](#)
  - IllustrationFigScatterPlotCoverage, [25](#)
  - IllustrationFigScatterPlotPower, [26](#)
  - IllustrationFigScatterPlotSeBias, [27](#)
  - IllustrationFitDynr, [28](#)
  - IllustrationFitMx, [28](#)
  - IllustrationGenData, [29](#)
  - IllustrationMCPhiSigma, [30](#)
  - IllustrationPrepData, [30](#)
  - SimIllustration, [63](#)
  - SimIllustrationDynrBootPara, [64](#)
  - SimIllustrationDynrBootParaStdXMY, [65](#)
  - SimIllustrationDynrBootParaXMY, [66](#)
  - SimIllustrationDynrDeltaStdXMY, [67](#)
  - SimIllustrationDynrDeltaXMY, [68](#)
  - SimIllustrationDynrMCPhiSigma, [69](#)
  - SimIllustrationDynrMCStdXMY, [70](#)
  - SimIllustrationDynrMCXMY, [71](#)
  - SimIllustrationFitDynr, [72](#)
  - SimIllustrationFitMx, [73](#)

- SimIllustrationGenData, [74](#)
- SimIllustrationPara, [75](#)
- SumIllustration, [84](#)
- SumIllustrationDynrBootParaStdXMY, [85](#)
- SumIllustrationDynrBootParaXMY, [86](#)
- SumIllustrationDynrDeltaStdXMY, [87](#)
- SumIllustrationDynrDeltaXMY, [88](#)
- SumIllustrationDynrMCStdXMY, [88](#)
- SumIllustrationDynrMCXMY, [89](#)
- SumIllustrationFitDynr, [90](#)
- \* **manCTMed**
  - BootPara, [4](#)
  - BootParaStdXMY, [5](#)
  - BootParaStdXYM, [6](#)
  - BootParaStdYMX, [7](#)
  - BootParaXMY, [8](#)
  - BootParaXYM, [9](#)
  - BootParaYMX, [10](#)
  - Compress, [11](#)
  - DeltaStdXMY, [12](#)
  - DeltaStdXYM, [12](#)
  - DeltaStdYMX, [13](#)
  - DeltaXMY, [14](#)
  - DeltaXYM, [15](#)
  - DeltaYMX, [16](#)
  - FigPlotEffects, [16](#)
  - FigScatterPlotCoverage, [17](#)
  - FigScatterPlotPower, [18](#)
  - FigScatterPlotSeBias, [19](#)
  - FigScatterPlotType1, [20](#)
  - FitDynr, [21](#)
  - FitMx, [21](#)
  - GenData, [22](#)
  - IllustrationBootPara, [23](#)
  - IllustrationCompress, [24](#)
  - IllustrationFigPlotEffects, [25](#)
  - IllustrationFigScatterPlotCoverage, [25](#)
  - IllustrationFigScatterPlotPower, [26](#)
  - IllustrationFigScatterPlotSeBias, [27](#)
  - IllustrationFitDynr, [28](#)
  - IllustrationFitMx, [28](#)
  - IllustrationGenData, [29](#)
  - IllustrationMCPhiSigma, [30](#)
  - IllustrationPrepData, [30](#)
  - MCStdXMY, [37](#)
  - MCStdXYM, [38](#)
  - MCStdYMX, [39](#)
  - MCXMY, [40](#)
  - MCXYM, [41](#)
  - MCYMX, [42](#)
  - PhiHat, [43](#)
  - RandomMeasurement, [44](#)
  - Sim, [46](#)
  - SimDynrBootPara, [47](#)
  - SimDynrBootParaStdXMY, [48](#)
  - SimDynrBootParaStdYMX, [49](#)
  - SimDynrBootParaXMY, [50](#)
  - SimDynrBootParaYMX, [51](#)
  - SimDynrDeltaStdXMY, [52](#)
  - SimDynrDeltaStdYMX, [53](#)
  - SimDynrDeltaXMY, [54](#)
  - SimDynrDeltaYMX, [55](#)
  - SimDynrMCStdXMY, [56](#)
  - SimDynrMCStdYMX, [57](#)
  - SimDynrMCXMY, [58](#)
  - SimDynrMCYMX, [59](#)
  - SimFitDynr, [60](#)
  - SimFitMx, [61](#)
  - SimFN, [62](#)
  - SimGenData, [62](#)
  - SimIllustration, [63](#)
  - SimIllustrationDynrBootPara, [64](#)
  - SimIllustrationDynrBootParaStdXMY, [65](#)
  - SimIllustrationDynrBootParaXMY, [66](#)
  - SimIllustrationDynrDeltaStdXMY, [67](#)
  - SimIllustrationDynrDeltaXMY, [68](#)
  - SimIllustrationDynrMCPhiSigma, [69](#)
  - SimIllustrationDynrMCStdXMY, [70](#)
  - SimIllustrationDynrMCXMY, [71](#)
  - SimIllustrationFitDynr, [72](#)
  - SimIllustrationFitMx, [73](#)
  - SimIllustrationGenData, [74](#)
  - SimIllustrationPara, [75](#)
  - SimPara, [76](#)
  - SimProj, [76](#)
  - Sum, [77](#)
  - SumDynrDeltaStdXMY, [77](#)
  - SumDynrDeltaStdYMX, [78](#)
  - SumDynrDeltaXMY, [79](#)
  - SumDynrDeltaYMX, [80](#)
  - SumDynrMCStdXMY, [80](#)

- SumDynrMCStdYMX, 81
- SumDynrMCXMY, 82
- SumDynrMCYMX, 83
- SumFitDynr, 83
- SumIllustration, 84
- SumIllustrationDynrBootParaStdXMY, 85
- SumIllustrationDynrBootParaXMY, 86
- SumIllustrationDynrDeltaStdXMY, 87
- SumIllustrationDynrDeltaXMY, 88
- SumIllustrationDynrMCStdXMY, 88
- SumIllustrationDynrMCXMY, 89
- SumIllustrationFitDynr, 90
- ThetaHat, 91
- \* **parameters**
  - params, 43
  - results, 45
- \* **simulation**
  - Sim, 46
  - SimDynrBootPara, 47
  - SimDynrBootParaStdXMY, 48
  - SimDynrBootParaStdYMX, 49
  - SimDynrBootParaXMY, 50
  - SimDynrBootParaYMX, 51
  - SimDynrDeltaStdXMY, 52
  - SimDynrDeltaStdYMX, 53
  - SimDynrDeltaXMY, 54
  - SimDynrDeltaYMX, 55
  - SimDynrMCStdXMY, 56
  - SimDynrMCStdYMX, 57
  - SimDynrMCXMY, 58
  - SimDynrMCYMX, 59
  - SimFitDynr, 60
  - SimFitMx, 61
  - SimFN, 62
  - SimGenData, 62
  - SimPara, 76
  - SimProj, 76
  - Sum, 77
  - SumDynrDeltaStdXMY, 77
  - SumDynrDeltaStdYMX, 78
  - SumDynrDeltaXMY, 79
  - SumDynrDeltaYMX, 80
  - SumDynrMCStdXMY, 80
  - SumDynrMCStdYMX, 81
  - SumDynrMCXMY, 82
  - SumDynrMCYMX, 83
  - SumFitDynr, 83
  - SumIllustration, 84
  - SumIllustrationDynrBootParaStdXMY, 85
  - SumIllustrationDynrBootParaXMY, 86
  - SumIllustrationDynrDeltaStdXMY, 87
  - SumIllustrationDynrDeltaXMY, 88
  - SumIllustrationDynrMCStdXMY, 88
  - SumIllustrationDynrMCXMY, 89
  - SumIllustrationFitDynr, 90
- \* **summary**
  - Sum, 77
  - SumDynrDeltaStdXMY, 77
  - SumDynrDeltaStdYMX, 78
  - SumDynrDeltaXMY, 79
  - SumDynrDeltaYMX, 80
  - SumDynrMCStdXMY, 80
  - SumDynrMCStdYMX, 81
  - SumDynrMCXMY, 82
  - SumDynrMCYMX, 83
  - SumFitDynr, 83
  - SumIllustration, 84
  - SumIllustrationDynrBootParaStdXMY, 85
  - SumIllustrationDynrBootParaXMY, 86
  - SumIllustrationDynrDeltaStdXMY, 87
  - SumIllustrationDynrDeltaXMY, 88
  - SumIllustrationDynrMCStdXMY, 88
  - SumIllustrationDynrMCXMY, 89
  - SumIllustrationFitDynr, 90
- BootPara, 4, 5–10, 12–16, 23, 37–42
- BootPara(), 5–10
- BootParaStdXMY, 5, 5–10, 12–16, 23, 37–42
- BootParaStdXYM, 5, 6, 7–10, 12–16, 23, 37–42
- BootParaStdYMX, 5, 6, 7, 8–10, 12–16, 23, 37–42
- BootParaXMY, 5–7, 8, 9, 10, 12–16, 23, 37–42
- BootParaXYM, 5–8, 9, 10, 12–16, 23, 37–42
- BootParaYMX, 5–9, 10, 12–16, 23, 37–42
- Compress, 11, 24
- DeltaStdXMY, 5–10, 12, 13–16, 23, 37–42
- DeltaStdXYM, 5–10, 12, 12, 14–16, 23, 37–42
- DeltaStdYMX, 5–10, 12, 13, 13–16, 23, 37–42
- DeltaXMY, 5–10, 12, 13, 14, 14–16, 23, 37–42
- DeltaXYM, 5–10, 12–14, 15, 16, 23, 37–42
- DeltaYMX, 5–10, 12–15, 16, 23, 37–42
- dynr, 21, 28
- FigPlotEffects, 16, 18–20, 25–27
- FigScatterPlotCoverage, 17, 17–20, 25–27
- FigScatterPlotPower, 17, 18, 18–20, 25–27
- FigScatterPlotSeBias, 17, 18, 19, 20, 25–27
- FigScatterPlotType1, 17–19, 20, 25–27
- FitDynr, 21, 22, 28–31, 43, 91
- FitDynr(), 4, 43, 91

- FitMx, [21](#), [21](#), [28–31](#), [43](#), [91](#)
- FitMx(), [4](#), [43](#), [91](#)
- GenData, [22](#), [29](#), [44](#)
- GenData(), [44](#)
- illustration\_dist, [31](#)
- illustration\_dist\_dt, [32](#)
- illustration\_dist\_dt\_mc, [32](#)
- illustration\_dist\_mc, [33](#)
- illustration\_dist\_med, [33](#)
- illustration\_dist\_med\_mc, [34](#)
- illustration\_dist\_med\_std, [34](#)
- illustration\_dist\_med\_std\_mc, [35](#)
- illustration\_results, [35](#)
- IllustrationBootPara, [5–10](#), [12–16](#), [23](#), [37–42](#)
- IllustrationCompress, [11](#), [24](#)
- IllustrationFigPlotEffects, [17–20](#), [25](#), [26](#), [27](#)
- IllustrationFigScatterPlotCoverage, [17–20](#), [25](#), [25–27](#)
- IllustrationFigScatterPlotPower, [17–20](#), [25](#), [26](#), [26](#), [27](#)
- IllustrationFigScatterPlotSeBias, [17–20](#), [25](#), [26](#), [27](#)
- IllustrationFitDynr, [21](#), [22](#), [28](#), [29–31](#), [43](#), [91](#)
- IllustrationFitDynr(), [4](#), [43](#), [91](#)
- IllustrationFitMx, [21](#), [22](#), [28](#), [28](#), [30](#), [31](#), [43](#), [91](#)
- IllustrationFitMx(), [4](#), [43](#), [91](#)
- IllustrationGenData, [22](#), [29](#), [44](#)
- IllustrationGenData(), [30](#), [31](#)
- IllustrationMCPhiSigma, [21](#), [22](#), [28](#), [29](#), [30](#), [31](#), [43](#), [91](#)
- IllustrationPrepData, [21](#), [22](#), [28](#), [29](#), [30](#), [30](#), [43](#), [91](#)
- IllustrationPrepData(), [28](#)
- MCStdXMY, [5–10](#), [12–16](#), [23](#), [37](#), [38–42](#)
- MCStdXYM, [5–10](#), [12–16](#), [23](#), [37](#), [38](#), [39–42](#)
- MCStdYMX, [5–10](#), [12–16](#), [23](#), [37](#), [38](#), [39](#), [40–42](#)
- MCXMY, [5–10](#), [12–16](#), [23](#), [37–39](#), [40](#), [41](#), [42](#)
- MCXYM, [5–10](#), [12–16](#), [23](#), [37–40](#), [41](#), [42](#)
- MCYMX, [5–10](#), [12–16](#), [23](#), [37–41](#), [42](#)
- OpenMx, [21](#), [28](#)
- params, [43](#)
- PhiHat, [21](#), [22](#), [28–31](#), [43](#), [91](#)
- PhiHat(), [8–10](#), [14–16](#), [40–42](#)
- RandomMeasurement, [22](#), [29](#), [44](#)
- RandomMeasurement(), [21](#), [22](#)
- results, [45](#)
- Sim, [46](#)
- SimDynrBootPara, [47](#)
- SimDynrBootParaStdXMY, [48](#)
- SimDynrBootParaStdYMX, [49](#)
- SimDynrBootParaXMY, [50](#)
- SimDynrBootParaYMX, [51](#)
- SimDynrDeltaStdXMY, [52](#)
- SimDynrDeltaStdYMX, [53](#)
- SimDynrDeltaXMY, [54](#)
- SimDynrDeltaYMX, [55](#)
- SimDynrMCStdXMY, [56](#)
- SimDynrMCStdYMX, [57](#)
- SimDynrMCXMY, [58](#)
- SimDynrMCYMX, [59](#)
- SimFitDynr, [60](#)
- SimFitMx, [61](#)
- SimFN, [62](#)
- SimGenData, [62](#)
- SimIllustration, [63](#)
- SimIllustrationDynrBootPara, [64](#)
- SimIllustrationDynrBootParaStdXMY, [65](#)
- SimIllustrationDynrBootParaXMY, [66](#)
- SimIllustrationDynrDeltaStdXMY, [67](#)
- SimIllustrationDynrDeltaXMY, [68](#)
- SimIllustrationDynrMCPhiSigma, [69](#)
- SimIllustrationDynrMCStdXMY, [70](#)
- SimIllustrationDynrMCXMY, [71](#)
- SimIllustrationFitDynr, [72](#)
- SimIllustrationFitMx, [73](#)
- SimIllustrationGenData, [74](#)
- SimIllustrationPara, [75](#)
- SimPara, [76](#)
- SimProj, [76](#)
- simStateSpace::SimSSMOUFixed(), [22](#), [29](#)
- Sum, [77](#)
- SumDynrDeltaStdXMY, [77](#)
- SumDynrDeltaStdYMX, [78](#)
- SumDynrDeltaXMY, [79](#)
- SumDynrDeltaYMX, [80](#)
- SumDynrMCStdXMY, [80](#)
- SumDynrMCStdYMX, [81](#)
- SumDynrMCXMY, [82](#)



SumDynrMCYMX, [83](#)  
SumFitDynr, [83](#)  
SumIllustration, [84](#)  
SumIllustrationDynrBootParaStdXMY, [85](#)  
SumIllustrationDynrBootParaXMY, [86](#)  
SumIllustrationDynrDeltaStdXMY, [87](#)  
SumIllustrationDynrDeltaXMY, [88](#)  
SumIllustrationDynrMCStdXMY, [88](#)  
SumIllustrationDynrMCXMY, [89](#)  
SumIllustrationFitDynr, [90](#)  
  
ThetaHat, [21](#), [22](#), [28–31](#), [43](#), [91](#)  
ThetaHat(), [5–7](#), [12](#), [13](#), [37–39](#)