

# Package: itrimhoch (via r-universe)

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**Type** Package

**Title** Improved Trimmed Weighted Hochberg Procedures and Sample Size Optimization

**Version** 1.0.0

**Description** The improved trimmed weighted Hochberg procedure provides increased statistical power and relaxes the dependence assumptions for familywise error rate control compared to the original weighted Hochberg procedure. This package computes the boundaries required for implementing the proposed methodology and includes sample size optimization methods. See Gou, J., Chang, Y., Li, T., and Zhang, F.(2025). Improved trimmed weighted Hochberg procedures with two endpoints and sample size optimization. Technical Report.

**License** GPL-3

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find\_k\_given\_rho\_target\_mvtnorm

*Find the difference between the error rate when k and rho are both given and the prespecified alpha level*

---

### Description

Find the difference between the error rate when k and rho are both given and the prespecified alpha level

### Usage

```
find_k_given_rho_target_mvtnorm(k, rho, alpha, alphavec = c(alpha/2, alpha/2))
```

**Arguments**

k	a pre-specified constant in the improved trimmed weighted Hochberg procedure
rho	the correlation coefficient between two test statistics
alpha	the significance level
alphavec	a numeric vector of two values representing the weighted significance levels assigned to the two hypotheses

**Value**

the difference between the error rate when k is specified and rho is optimal and the prespecified alpha level

**Author(s)**

Jiangtao Gou

**References**

Gou, J., Chang, Y., Li, T., and Zhang, F. (2025). Improved trimmed weighted Hochberg procedures with two endpoints and sample size optimization. Technical Report.

---

find\_k\_target\_mvtnorm *Find the difference between the error rate when k is specified and rho is optimal and the prespecified alpha level*

---

**Description**

Find the difference between the error rate when k is specified and rho is optimal and the prespecified alpha level

**Usage**

```
find_k_target_mvtnorm(k, alpha, alphavec = c(alpha/2, alpha/2))
```

**Arguments**

k	a pre-specified constant in the improved trimmed weighted Hochberg procedure
alpha	the significance level
alphavec	a numeric vector of two values representing the weighted significance levels assigned to the two hypotheses

**Value**

the difference between the error rate when k is specified and rho is optimal and the prespecified alpha level

**Author(s)**

Jiangtao Gou

**References**

Gou, J., Chang, Y., Li, T., and Zhang, F. (2025). Improved trimmed weighted Hochberg procedures with two endpoints and sample size optimization. Technical Report.

---

find\_rho\_target\_mvtnorm

*Find the partial derivative of the error rate with respect to the correlation coefficient rho when k and rho are given*

---

**Description**

Find the partial derivative of the error rate with respect to the correlation coefficient rho when k and rho are given

**Usage**

```
find_rho_target_mvtnorm(rho, k, alpha, alphavec = c(alpha/2, alpha/2))
```

**Arguments**

rho	the correlation coefficient between two test statistics
k	a pre-specified constant in the improved trimmed weighted Hochberg procedure
alpha	the significance level
alphavec	a numeric vector of two values representing the weighted significance levels assigned to the two hypotheses

**Value**

the partial derivative of the error rate with respect to the correlation coefficient rho

**Author(s)**

Jiangtao Gou

**References**

Gou, J., Chang, Y., Li, T., and Zhang, F. (2025). Improved trimmed weighted Hochberg procedures with two endpoints and sample size optimization. Technical Report.

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iHpTarget1	<i>Find the difference between the achieved power and the desired power for rejecting H1 using the improved trimmed or truncated weighted Hochberg procedure</i>
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---

**Description**

Find the difference between the achieved power and the desired power for rejecting H1 using the improved trimmed or truncated weighted Hochberg procedure

**Usage**

iHpTarget1(n, alpha1, alpha, k, beta1, deltavec, rho)

**Arguments**

n	the sample size
alpha1	the weighted significance levels assigned to H1
alpha	the significance level
k	a pre-specified constant in the improved trimmed weighted Hochberg procedure
beta1	one minus the desired power for rejecting H1
deltavec	a numeric vector of two values representing the effect sizes for the two hypotheses
rho	the correlation coefficient between two test statistics

**Value**

the difference between the achieved power and the desired power for rejecting H1 using the improved trimmed or truncated weighted Hochberg procedure

**Author(s)**

Jiangtao Gou

**References**

Gou, J., Chang, Y., Li, T., and Zhang, F. (2025). Improved trimmed weighted Hochberg procedures with two endpoints and sample size optimization. Technical Report.

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iHpTarget1m	<i>Find the difference between the achieved power and the desired power for rejecting H1 using the improved trimmed or truncated weighted Hochberg procedure with allowance for different data maturities</i>
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---

### Description

Find the difference between the achieved power and the desired power for rejecting H1 using the improved trimmed or truncated weighted Hochberg procedure with allowance for different data maturities

### Usage

iHpTarget1m(n, alpha1, alpha, k, beta1, deltavec, rho, maturity)

### Arguments

n	the sample size
alpha1	the weighted significance levels assigned to H1
alpha	the significance level
k	a pre-specified constant in the improved trimmed weighted Hochberg procedure
beta1	one minus the desired power for rejecting H1
deltavec	a numeric vector of two values representing the effect sizes for the two hypotheses
rho	the correlation coefficient between two test statistics
maturity	a numeric vector of two values representing the data maturities for the two hypotheses

### Value

the difference between the achieved power and the desired power for rejecting H1

### Author(s)

Jiangtao Gou

### References

Gou, J., Chang, Y., Li, T., and Zhang, F. (2025). Improved trimmed weighted Hochberg procedures with two endpoints and sample size optimization. Technical Report.

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iHpTarget2	<i>Find the difference between the achieved power and the desired power for rejecting H2 using the improved trimmed or truncated weighted Hochberg procedure</i>
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---

### Description

Find the difference between the achieved power and the desired power for rejecting H2 using the improved trimmed or truncated weighted Hochberg procedure

### Usage

```
iHpTarget2(n, alpha1, alpha, k, beta2, deltavec, rho)
```

### Arguments

n	the sample size
alpha1	the weighted significance levels assigned to H1
alpha	the significance level
k	a pre-specified constant in the improved trimmed weighted Hochberg procedure
beta2	one minus the desired power for rejecting H2
deltavec	a numeric vector of two values representing the effect sizes for the two hypotheses
rho	the correlation coefficient between two test statistics

### Value

the difference between the achieved power and the desired power for rejecting H2 using the improved trimmed or truncated weighted Hochberg procedure

### Author(s)

Jiangtao Gou

### References

Gou, J., Chang, Y., Li, T., and Zhang, F. (2025). Improved trimmed weighted Hochberg procedures with two endpoints and sample size optimization. Technical Report.

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iHpTarget2m	<i>Find the difference between the achieved power and the desired power for rejecting H2 using the improved trimmed or truncated weighted Hochberg procedure with allowance for different data maturities</i>
-------------	---

---

### Description

Find the difference between the achieved power and the desired power for rejecting H2 using the improved trimmed or truncated weighted Hochberg procedure with allowance for different data maturities

### Usage

iHpTarget2m(n, alpha1, alpha, k, beta2, deltavec, rho, maturity)

### Arguments

n	the sample size
alpha1	the weighted significance levels assigned to H1
alpha	the significance level
k	a pre-specified constant in the improved trimmed weighted Hochberg procedure
beta2	one minus the desired power for rejecting H2
deltavec	a numeric vector of two values representing the effect sizes for the two hypotheses
rho	the correlation coefficient between two test statistics
maturity	a numeric vector of two values representing the data maturities for the two hypotheses

### Value

the difference between the achieved power and the desired power for rejecting H2

### Author(s)

Jiangtao Gou

### References

Gou, J., Chang, Y., Li, T., and Zhang, F. (2025). Improved trimmed weighted Hochberg procedures with two endpoints and sample size optimization. Technical Report.

---

interpolate_zero	<i>Calculate the x-coordinates of a function where zero crossings occur</i>
------------------	---

---

**Description**

Calculate the x-coordinates of a function where zero crossings occur

**Usage**

```
interpolate_zero(values, x = NULL)
```

**Arguments**

values	a numeric vector representing the function's output at specific points
x	Aa vector of x-coordinates corresponding to the values. If not provided, it defaults to 1:length(values)

**Value**

the x-coordinates where zero crossings occur. If no crossings are found, it returns NA

---

itwchochPower	<i>Power for rejecting H1 using various types of the Hochberg Procedure</i>
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---

**Description**

Power for rejecting H1 using various types of the Hochberg Procedure

**Usage**

```
itwchochPower(n, alpha1, alpha, deltavec, rho, proctype = "i", k = 0)
```

**Arguments**

n	the sample size
alpha1	the weighted significance levels assigned to H1
alpha	the significance level
deltavec	a numeric vector of two values representing the effect sizes for the two hypotheses
rho	the correlation coefficient between two test statistics
proctype	the improved trimmed weighted Hochberg procedure is denoted by i, the trimmed weighted Hochberg procedure is denoted by t, the weighted Hochberg procedure is denoted by w, and the conservative weighted Hochberg procedure is denoted by c
k	a pre-specified constant in the improved trimmed weighted Hochberg procedure

**Value**

the power for rejecting H1 is denoted by pwr1, the power for rejecting H2 is denoted by pwr2, and the power for rejecting both H1 and H2 is denoted by pwr12

**Author(s)**

Jiangtao Gou

Fengqing Zhang

**References**

Gou, J., Chang, Y., Li, T., and Zhang, F. (2025). Improved trimmed weighted Hochberg procedures with two endpoints and sample size optimization. Technical Report.

**Examples**

```
itwchHochPower(n = 100,
alpha1 = 0.0125, alpha = 0.025,
deltavec = c(0.2, 0.25), rho = 0.2,
proctype = "i", k = 0)
itwchHochPower(n = 100,
alpha1 = 0.0125, alpha = 0.025,
deltavec = c(0, 0), rho = 0,
proctype = "w", k = 0)
```

---

optk

*The two-step algorithm to calculate the best k value for the improved trimmed Hochberg method to ensure that the maximum type I error rate reaches alpha exactly when rho is arbitrary*

---

**Description**

The two-step algorithm to calculate the best k value for the improved trimmed Hochberg method to ensure that the maximum type I error rate reaches alpha exactly when rho is arbitrary

**Usage**

```
optk(alpha, alphavec = c(alpha/2, alpha/2))
```

**Arguments**

alpha            the significance level

alphavec        a numeric vector of two values representing the weighted significance levels assigned to the two hypotheses

**Value**

the best k value k\_opt and the rho value that makes the type I error rate reaches the maximum value rho\_opt

**Author(s)**

Jiangtao Gou  
Fengqing Zhang

**References**

Gou, J., Chang, Y., Li, T., and Zhang, F. (2025). Improved trimmed weighted Hochberg procedures with two endpoints and sample size optimization. Technical Report.

**Examples**

```
optk(alpha = 0.025)
```

---

optrho	<i>Calculate the rho value that reaches the maximum type I error rate in the improved trimmed Hochberg method when k value is given</i>
--------	---

---

**Description**

Calculate the rho value that reaches the maximum type I error rate in the improved trimmed Hochberg method when k value is given

**Usage**

```
optrho(k, alpha, alphavec = c(alpha/2, alpha/2))
```

**Arguments**

k	a pre-specified constant in the improved trimmed weighted Hochberg procedure
alpha	the significance level
alphavec	a numeric vector of two values representing the weighted significance levels assigned to the two hypotheses

**Value**

the rho value that makes the type I error rate reaches the maximum value rho\_opt and the type I error rate errorrate

**Author(s)**

Jiangtao Gou  
Fengqing Zhang

**References**

Gou, J., Chang, Y., Li, T., and Zhang, F. (2025). Improved trimmed weighted Hochberg procedures with two endpoints and sample size optimization. Technical Report.

**Examples**

```
optrho(k = 2/3, alpha = 0.025)
```

---

optsamplesize_iHp	<i>Compute the optimal sample size for the improved trimmed weighted Hochberg procedure</i>
-------------------	---

---

**Description**

Compute the optimal sample size for the improved trimmed weighted Hochberg procedure

**Usage**

```
optsamplesize_iHp(
  alpha,
  k,
  betavec,
  deltavec,
  rho,
  ninterval = c(2, 2000),
  alphalist = seq(from = 0, to = alpha, by = 0.005)
)
```

**Arguments**

alpha	the significance level
k	a pre-specified constant in the improved trimmed weighted Hochberg procedure
betavec	a numeric vector of two values, including one minus the desired power for rejecting H1 and one minus the desired power for rejecting H2
deltavec	a numeric vector of two values representing the effect sizes for the two hypotheses
rho	the correlation coefficient between two test statistics
ninterval	a vector containing the end-points of the interval to be searched for optimal sample size
alphalist	a vector of discrete alpha values

**Value**

the overall optimal sample size for the improved trimmed weighted Hochberg procedure

**Author(s)**

Jiangtao Gou  
Fengqing Zhang

**References**

Gou, J., Chang, Y., Li, T., and Zhang, F. (2025). Improved trimmed weighted Hochberg procedures with two endpoints and sample size optimization. Technical Report.

**Examples**

```

rrr <- 2 # Allocation ratio
alpha <- 0.025
k <- 2/3
ninterval <- c(2, 1000)
betavec <- c(0.05, 0.15)
rho <- 0.3
psivec <- c(0.67, 0.73)
thetavec <- log(psivec)
deltavec <- (-thetavec)*sqrt(rrr)/(1+rrr)
result <- optsamplesize_iHp(alpha = alpha, k = k,
betavec = betavec, deltavec = deltavec,
rho = rho, ninterval = ninterval)
result$nopt

```

---

optsamplesize_iHpm	<i>Compute the optimal sample size for the improved trimmed weighted Hochberg procedure with allowance for different data maturities</i>
--------------------	--

---

**Description**

Compute the optimal sample size for the improved trimmed weighted Hochberg procedure with allowance for different data maturities

**Usage**

```

optsamplesize_iHpm(
  alpha,
  k,
  betavec,
  deltavec,
  rho,
  maturity,
  ninterval = c(2, 2000),
  alphalist = seq(from = 0, to = alpha, by = 0.005)
)

```

**Arguments**

alpha	the significance level
k	a pre-specified constant in the improved trimmed weighted Hochberg procedure
betavec	a numeric vector of two values, including one minus the desired power for rejecting H1 and one minus the desired power for rejecting H2
deltavec	a numeric vector of two values representing the effect sizes for the two hypotheses
rho	the correlation coefficient between two test statistics
maturity	a numeric vector of two values representing the data maturities for the two hypotheses
ninterval	a vector containing the end-points of the interval to be searched for optimal sample size
alphalist	a vector of discrete alpha values

**Value**

the overall optimal sample size for the improved trimmed weighted Hochberg procedure with allowance for different data maturities

**Author(s)**

Jiangtao Gou  
Fengqing Zhang

**References**

Gou, J., Chang, Y., Li, T., and Zhang, F. (2025). Improved trimmed weighted Hochberg procedures with two endpoints and sample size optimization. Technical Report.

**Examples**

```

rrr <- 2
alpha <- 0.025
k <- 0.6761
ninterval <- c(2, 1000)
betavec <- c(0.10, 0.10)
rho <- 0.4
maturity <- c(0.65, 0.70)
psivec <- c(0.67, 0.73)
thetavec <- log(psivec)
deltavec <- (-thetavec)*sqrt(rrr)/(1+rrr)
result <- optsamplesize_iHpm(alpha = alpha, k = k,
betavec = betavec, deltavec = deltavec,
rho = rho, maturity = maturity,
ninterval = ninterval)
result$nopt

```

---

optsamplesize_tHp	<i>Compute the optimal sample size for the weighted trimmed or truncated Hochberg procedure</i>
-------------------	---

---

**Description**

Compute the optimal sample size for the weighted trimmed or truncated Hochberg procedure

**Usage**

```
optsamplesize_tHp(
  alpha,
  betavec,
  deltavec,
  rho,
  ninterval = c(2, 2000),
  alphalist = seq(from = 0, to = alpha, by = 0.005)
)
```

**Arguments**

alpha	the significance level
betavec	a numeric vector of two values, including one minus the desired power for rejecting H1 and one minus the desired power for rejecting H2
deltavec	a numeric vector of two values representing the effect sizes for the two hypotheses
rho	the correlation coefficient between two test statistics
ninterval	a vector containing the end-points of the interval to be searched for optimal sample size
alphalist	a vector of discrete alpha values

**Value**

the overall optimal sample size for the weighted trimmed or truncated Hochberg procedure

**Author(s)**

Jiangtao Gou  
Fengqing Zhang

**References**

Gou, J., Chang, Y., Li, T., and Zhang, F. (2025). Improved trimmed weighted Hochberg procedures with two endpoints and sample size optimization. Technical Report.

**Examples**

```
psivec <- c(0.76, 0.72)
thetavec <- log(psivec)
deltavec <- (-thetavec)/2
result <- optsamplesize_tHp(alpha = 0.05, betavec = c(0.20, 0.10),
deltavec = deltavec , rho = -0.1)
result$nopt
```

---

optsamplesize\_wHolmpm *Compute the optimal sample size for the weighted Holm procedure with allowance for different data maturities*

---

**Description**

Compute the optimal sample size for the weighted Holm procedure with allowance for different data maturities

**Usage**

```
optsamplesize_wHolmpm(
  alpha,
  betavec,
  deltavec,
  rho,
  maturity,
  ninterval = c(2, 2000),
  alphalist = seq(from = 0, to = alpha, by = 0.005)
)
```

**Arguments**

alpha	the significance level
betavec	a numeric vector of two values, including one minus the desired power for rejecting H1 and one minus the desired power for rejecting H2
deltavec	a numeric vector of two values representing the effect sizes for the two hypotheses
rho	the correlation coefficient between two test statistics
maturity	a numeric vector of two values representing the data maturities for the two hypotheses
ninterval	a vector containing the end-points of the interval to be searched for optimal sample size
alphalist	a vector of discrete alpha values

**Value**

the overall optimal sample size for the weighted Holm procedure with allowance for different data maturities

**Author(s)**

Jiangtao Gou

Fengqing Zhang

**References**

Gou, J., Chang, Y., Li, T., and Zhang, F. (2025). Improved trimmed weighted Hochberg procedures with two endpoints and sample size optimization. Technical Report.

**Examples**

```
rrr <- 2
alpha <- 0.025
k <- 0.6761
ninterval <- c(2, 1000)
betavec <- c(0.05, 0.15)
rho <- 0.4
maturity <- c(0.65, 0.70)
psivec <- c(0.67, 0.73)
thetavec <- log(psivec)
deltavec <- (-thetavec)*sqrt(rrr)/(1+rrr)
result <- optsamplesize_wHolmpm(alpha = alpha, betavec = betavec,
deltavec = deltavec , rho = rho,
maturity = maturity, ninterval = ninterval)
result$nopt
```

---

`optsamplesize_wHp`*Compute the optimal sample size for the weighted Hochberg procedure*

---

**Description**

Compute the optimal sample size for the weighted Hochberg procedure

**Usage**

```
optsamplesize_wHp(
  alpha,
  betavec,
  deltavec,
  rho,
  ninterval = c(2, 2000),
  alphalist = seq(from = 0, to = alpha, by = 0.005)
)
```

**Arguments**

alpha	the significance level
betavec	a numeric vector of two values, including one minus the desired power for rejecting H1 and one minus the desired power for rejecting H2
deltavec	a numeric vector of two values representing the effect sizes for the two hypotheses
rho	the correlation coefficient between two test statistics
ninterval	a vector containing the end-points of the interval to be searched for optimal sample size
alphalist	a vector of discrete alpha values

**Value**

the overall optimal sample size for the weighted Hochberg procedure

**Author(s)**

Jiangtao Gou  
Fengqing Zhang

**References**

Gou, J., Chang, Y., Li, T., and Zhang, F. (2025). Improved trimmed weighted Hochberg procedures with two endpoints and sample size optimization. Technical Report.

**Examples**

```
psivec <- c(0.76, 0.72)
thetavec <- log(psivec)
deltavec <- (-thetavec)/2
result <- optsamplesize_wHp(alpha = 0.05, betavec = c(0.20, 0.10),
deltavec = deltavec , rho = -0.1)
result$nopt
```

---

tHpTarget1	<i>Find the difference between the achieved power and the desired power for rejecting H1 using the weighted trimmed or truncated Hochberg procedure</i>
------------	---

---

**Description**

Find the difference between the achieved power and the desired power for rejecting H1 using the weighted trimmed or truncated Hochberg procedure

**Usage**

```
tHpTarget1(n, alpha1, alpha, beta1, deltavec, rho)
```

**Arguments**

n	the sample size
alpha1	the weighted significance levels assigned to H1
alpha	the significance level
beta1	one minus the desired power for rejecting H1
deltavec	a numeric vector of two values representing the effect sizes for the two hypotheses
rho	the correlation coefficient between two test statistics

**Value**

the difference between the achieved power and the desired power for rejecting H1 using the weighted trimmed or truncated Hochberg procedure

**Author(s)**

Jiangtao Gou

**References**

Gou, J., Chang, Y., Li, T., and Zhang, F. (2025). Improved trimmed weighted Hochberg procedures with two endpoints and sample size optimization. Technical Report.

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tHpTarget2	<i>Find the difference between the achieved power and the desired power for rejecting H2 using the weighted trimmed or truncated Hochberg procedure</i>
------------	---

---

**Description**

Find the difference between the achieved power and the desired power for rejecting H2 using the weighted trimmed or truncated Hochberg procedure

**Usage**

```
tHpTarget2(n, alpha1, alpha, beta2, deltavec, rho)
```

**Arguments**

n	the sample size
alpha1	the weighted significance levels assigned to H1
alpha	the significance level
beta2	one minus the desired power for rejecting H2
deltavec	a numeric vector of two values representing the effect sizes for the two hypotheses
rho	the correlation coefficient between two test statistics

**Value**

the difference between the achieved power and the desired power for rejecting H2 using the weighted trimmed or truncated Hochberg procedure

**Author(s)**

Jiangtao Gou

**References**

Gou, J., Chang, Y., Li, T., and Zhang, F. (2025). Improved trimmed weighted Hochberg procedures with two endpoints and sample size optimization. Technical Report.

---

typeIerror\_Simes\_mvtnorm

*Calculate the type I error rate of the weighted Simes test*

---

**Description**

Calculate the type I error rate of the weighted Simes test

**Usage**

```
typeIerror_Simes_mvtnorm(
  rho,
  adjFct = 0,
  alpha,
  alphavec = c(alpha/2, alpha/2)
)
```

**Arguments**

rho	the correlation coefficient between two test statistics
adjFct	a pre-specified constant in the improved weighted Hochberg procedure, called the adjustment factor or k value
alpha	the significance level
alphavec	a numeric vector of two values representing the weighted significance levels assigned to the two hypotheses

**Value**

the type I error rate

**Author(s)**

Jiangtao Gou

**References**

Gou, J., Chang, Y., Li, T., and Zhang, F. (2025). Improved trimmed weighted Hochberg procedures with two endpoints and sample size optimization. Technical Report.

**Examples**

```
typeIError_trimSimes_mvtnorm(rho = 0, adjFct = 0, alpha = 0.05)
```

---

```
typeIError_trimSimes_mvtnorm
```

*Calculate the type I error rate of the trimmed weighted Simes test*

---

**Description**

Calculate the type I error rate of the trimmed weighted Simes test

**Usage**

```
typeIError_trimSimes_mvtnorm(  
  rho,  
  adjFct,  
  alpha,  
  alphavec = c(alpha/2, alpha/2)  
)
```

**Arguments**

rho	the correlation coefficient between two test statistics
adjFct	a pre-specified constant in the improved trimmed weighted Hochberg procedure, called the adjustment factor or k value
alpha	the significance level
alphavec	a numeric vector of two values representing the weighted significance levels assigned to the two hypotheses

**Value**

the type I error rate

**Author(s)**

Jiangtao Gou

**References**

Gou, J., Chang, Y., Li, T., and Zhang, F. (2025). Improved trimmed weighted Hochberg procedures with two endpoints and sample size optimization. Technical Report.

**Examples**

```
typeIError_trimSimes_mvtnorm(rho = 0, adjFct = 0, alpha = 0.05)
```

---

wHolmTarget1	<i>Find the difference between the achieved power and the desired power for rejecting H1 using the weighted Holm procedure</i>
--------------	--

---

**Description**

Find the difference between the achieved power and the desired power for rejecting H1 using the weighted Holm procedure

**Usage**

```
wHolmTarget1(n, alpha1, alpha, beta1, deltavec, rho)
```

**Arguments**

n	the sample size
alpha1	the weighted significance levels assigned to H1
alpha	the significance level
beta1	one minus the desired power for rejecting H1
deltavec	a numeric vector of two values representing the effect sizes for the two hypotheses
rho	the correlation coefficient between two test statistics

**Value**

the difference between the achieved power and the desired power for rejecting H1

**Author(s)**

Jiangtao Gou

**References**

Gou, J., Chang, Y., Li, T., and Zhang, F. (2025). Improved trimmed weighted Hochberg procedures with two endpoints and sample size optimization. Technical Report.

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wHolmTarget1m	<i>Find the difference between the achieved power and the desired power for rejecting H1 using the weighted Holm procedure with allowance for different data maturities</i>
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### Description

Find the difference between the achieved power and the desired power for rejecting H1 using the weighted Holm procedure with allowance for different data maturities

### Usage

```
wHolmTarget1m(n, alpha1, alpha, beta1, deltavec, rho, maturity)
```

### Arguments

n	the sample size
alpha1	the weighted significance levels assigned to H1
alpha	the significance level
beta1	one minus the desired power for rejecting H1
deltavec	a numeric vector of two values representing the effect sizes for the two hypotheses
rho	the correlation coefficient between two test statistics
maturity	a numeric vector of two values representing the data maturities for the two hypotheses

### Value

the difference between the achieved power and the desired power for rejecting H1

### Author(s)

Jiangtao Gou

### References

Gou, J., Chang, Y., Li, T., and Zhang, F. (2025). Improved trimmed weighted Hochberg procedures with two endpoints and sample size optimization. Technical Report.

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wHolmTarget2	<i>Find the difference between the achieved power and the desired power for rejecting H2 using the weighted Holm procedure</i>
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**Description**

Find the difference between the achieved power and the desired power for rejecting H2 using the weighted Holm procedure

**Usage**

```
wHolmTarget2(n, alpha1, alpha, beta2, deltavec, rho)
```

**Arguments**

n	the sample size
alpha1	the weighted significance levels assigned to H1
alpha	the significance level
beta2	one minus the desired power for rejecting H2
deltavec	a numeric vector of two values representing the effect sizes for the two hypotheses
rho	the correlation coefficient between two test statistics

**Value**

the difference between the achieved power and the desired power for rejecting H2

**Author(s)**

Jiangtao Gou

**References**

Gou, J., Chang, Y., Li, T., and Zhang, F. (2025). Improved trimmed weighted Hochberg procedures with two endpoints and sample size optimization. Technical Report.

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wHolmTarget2m	<i>Find the difference between the achieved power and the desired power for rejecting H2 using the weighted Holm procedure with allowance for different data maturities</i>
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### Description

Find the difference between the achieved power and the desired power for rejecting H2 using the weighted Holm procedure with allowance for different data maturities

### Usage

```
wHolmTarget2m(n, alpha1, alpha, beta2, deltavec, rho, maturity)
```

### Arguments

n	the sample size
alpha1	the weighted significance levels assigned to H1
alpha	the significance level
beta2	one minus the desired power for rejecting H2
deltavec	a numeric vector of two values representing the effect sizes for the two hypotheses
rho	the correlation coefficient between two test statistics
maturity	a numeric vector of two values representing the data maturities for the two hypotheses

### Value

the difference between the achieved power and the desired power for rejecting H2

### Author(s)

Jiangtao Gou

### References

Gou, J., Chang, Y., Li, T., and Zhang, F. (2025). Improved trimmed weighted Hochberg procedures with two endpoints and sample size optimization. Technical Report.

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wHpTarget1	<i>Find the difference between the achieved power and the desired power for rejecting H1 using the weighted Hochberg procedure</i>
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**Description**

Find the difference between the achieved power and the desired power for rejecting H1 using the weighted Hochberg procedure

**Usage**

```
wHpTarget1(n, alpha1, alpha, beta1, deltavec, rho)
```

**Arguments**

n	the sample size
alpha1	the weighted significance levels assigned to H1
alpha	the significance level
beta1	one minus the desired power for rejecting H1
deltavec	a numeric vector of two values representing the effect sizes for the two hypotheses
rho	the correlation coefficient between two test statistics

**Value**

the difference between the achieved power and the desired power for rejecting H1 using the weighted Hochberg procedure

**Author(s)**

Jiangtao Gou

**References**

Gou, J., Chang, Y., Li, T., and Zhang, F. (2025). Improved trimmed weighted Hochberg procedures with two endpoints and sample size optimization. Technical Report.

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wHpTarget2	<i>Find the difference between the achieved power and the desired power for rejecting H2 using the weighted Hochberg procedure</i>
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**Description**

Find the difference between the achieved power and the desired power for rejecting H2 using the weighted Hochberg procedure

**Usage**

```
wHpTarget2(n, alpha1, alpha, beta2, deltavec, rho)
```

**Arguments**

n	the sample size
alpha1	the weighted significance levels assigned to H1
alpha	the significance level
beta2	one minus the desired power for rejecting H2
deltavec	a numeric vector of two values representing the effect sizes for the two hypotheses
rho	the correlation coefficient between two test statistics

**Value**

the difference between the achieved power and the desired power for rejecting H2 using the weighted Hochberg procedure

**Author(s)**

Jiangtao Gou

**References**

Gou, J., Chang, Y., Li, T., and Zhang, F. (2025). Improved trimmed weighted Hochberg procedures with two endpoints and sample size optimization. Technical Report.

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