

# Package ‘vardiag’

December 14, 2025

**Version** 0.2-2

**Title** Variogram Diagnostics

**Depends** R (>= 2.0)

**Imports** graphics, grDevices, stats

**Description** Interactive variogram diagnostics.

**License** GPL (>= 2)

**URL** <https://github.com/edzer/vardiag/>

**NeedsCompilation** no

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**Repository** CRAN

**Date/Publication** 2025-12-14 19:30:02 UTC

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`CookRLF.varobj`*Plot of Cook's Distances and Reduction Lack of Fit*

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**Description**

Produces a plot of Cook's Distances and Lack of Fit for a variogram object.

**Usage**

```
CookRLF.varobj(v)
```

**Arguments**

`v`                      An object of class `varobj`

**Details**

A plot is created on the current graphics device with Reduction in Lack of Fit on the horizontal axis and Cook's Distances on the vertical axis.

After the plot is created, the cursor changes to a cross and points can be identified by left mouse clicks. When there are no further points to be identified, the identification can be ended by a right mouse click.

**Author(s)**

Ernst Glatzer

**References**

E. Glatzer, W.G. Mueller, 2004. Residual diagnostics for variogram fitting. Computers and Geosciences 30, pp 859-866.

**See Also**

[PlotDiag.varobj](#)

**Examples**

```
data(tulln)
CookRLF.varobj(vs50)
```

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interact.varobj	<i>Interactive Identification of Points in a Variogram Diagnostics Plot</i>
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### Description

Initiates selection of points in a Variogram Diagnostics Plot.

### Usage

```
interact.varobj(v, region = NULL, g = "s", pchi = 0.05, zmv = 0)
```

### Arguments

<b>v</b>	A variogram object
<b>region</b>	a n by 2 matrix of vertices of a polygon, which represents the region of interest.
<b>g</b>	the type of interaction with the following options: <b>l</b> selection of a point in the leave-one-out plot. <b>m</b> selection of one or two points in the map view. After selection of one point the selection process can be stopped by a right mouse click. <b>n</b> selection of a polygon region in the map view. This can be done by left clicking on the vertices of the polygon and stopping by a right mouse click. <b>s</b> selection of a point in the studentized square root cloud. <b>t</b> selection of a polygon region in the studentized square root cloud. This can be done by left clicking on the vertices of the polygon and stopping by a right mouse click. <b>x</b> selection of all points in the studentized square root cloud outside an approximate confidence bound with significance level given by pchi.
<b>pchi</b>	the significance level of the confidence bounds, if option g="x" is given.
<b>zmv</b>	the value of zmv determines which values will be plotted as third dimension (via circles with radius corresponding to the value) in the map view. The following values are possible: <b>0</b> no third dimension, <b>1</b> values of the original observations, <b>2</b> Cook's distances, <b>3</b> reduction in lack of fit.

### Details

Before the call of this function a diagnostic plot must be created by a call to the function `PlotDiag.varobj`.

If one point in the map view is selected, this point is marked blue and the index of this observation is printed near the point. All corresponding points in the square root cloud and the leave-one-out plot are marked blue.

If two points in the map view (or one point in the square root cloud or in the leave-one-out plot) are selected, this pair of points is joined by a magenta line and the corresponding point in the square

root cloud is marked magenta. One of the selected points in the map view and all corresponding points in the square root cloud and the leave-one-out plot are marked blue. The other selected point in the map view and all corresponding points in the square root cloud and the leave-one-out plot are marked red.

If a region is selected in the map view, all possible pairs of points within the region are joined by magenta lines and for each pair the corresponding point in the square root cloud is marked magenta.

If a region in the square root cloud is selected, all points within that region are marked magenta and all corresponding pairs of points in the map view are joined by magenta lines.

If option `g="x"` is selected, all points in the square root cloud outside the chosen confidence bound are marked magenta and all corresponding pairs of points in the map view are joined by magenta lines.

### Value

the index of the selected pair of observations.

### Author(s)

Ernst Glatzer

### References

E. Glatzer, W.G. Mueller, 2004. Residual diagnostics for variogram fitting. *Computers and Geosciences* 30, pp 859-866.

### See Also

[PlotDiag.varobj](#)

### Examples

```
data(tulln)
PlotDiag.varobj(vs50,region=tu1)
```

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PlotDiag.varobj	<i>Diagnostic Plots for Variograms</i>
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### Description

Produces diagnostic plots for a variogram object.

### Usage

```
PlotDiag.varobj(v, region = NULL, xyi = 0, zmv = 0)
```

**Arguments**

<code>v</code>	A variogram object
<code>region</code>	a n by 2 matrix of vertices of a polygon, which represents the region of interest.
<code>xyi</code>	the index of the pair of observations, which shall be marked in the plots.
<code>zmv</code>	the value of <code>zmv=</code> determines which values will be plotted as third dimension (via circles with radius corresponding to the value) in the map view. The following values are possible: <ul style="list-style-type: none"> <li><b>0</b> no third dimension,</li> <li><b>1</b> values of the original observations,</li> <li><b>2</b> Cook's distances,</li> <li><b>3</b> reduction in lack of fit.</li> </ul>

**Details**

Four plots are created on the current graphics device.

These plots are a map view, a square root cloud with the fitted model, a leave-one-out plot and a plot of decorrelated residuals. If the argument `region` is given, this region is plotted as a polygon in the map view. If the argument `xyi` is given, the corresponding pair of observations is marked as a blue and a red point in the map view and connected by a magenta line. Furthermore all the points in the square root cloud, which contain the first (second) observation in the pair are marked blue (red). The one point that contains both observations of the selected pair is marked magenta. The points in the leave-one-out plot are marked analogously.

**Value**

No value is returned. The function is called for its side effects, i.e. creating plots.

**Author(s)**

Ernst Glatzer

**References**

E. Glatzer, W.G. Mueller, 2004. Residual diagnostics for variogram fitting. Computers and Geosciences 30, pp 859-866.

**See Also**

[interact.varobj](#)

**Examples**

```
data(tu1n)
PlotDiag.varobj(vs50,region=tu1)
PlotDiag.varobj(vs50,region=tu1,xyi=144)
```

QQDecorr.varobj

*QQ-Plot of Decorrelated Residuals*

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**Description**

Produces a qq-plot of decorrelated residuals for a variogram object.

**Usage**

```
QQDecorr.varobj(v)
```

**Arguments**

`v`                      A variogram object

**Details**

A plot is created on the current graphics device with quantiles of the normal distribution on the horizontal axis and ordered values of the decorrelated residuals on the vertical axis.

A straight red line marks the expected curve of this plot. Additionally approximate confidence bounds for 10% significance are given.

**Author(s)**

Ernst Glatzer

**References**

E. Glatzer, W.G. Mueller, 2004. Residual diagnostics for variogram fitting. Computers and Geosciences 30, pp 859-866.

**See Also**

[PlotDiag.varobj](#)

**Examples**

```
data(tulln)
QQDecorr.varobj(vs50)
```

**Description**

Produces a qq-plot of variogram cloud entries for a variogram object.

**Usage**

```
QQVarcloud.varobj(v)
```

**Arguments**

v                      A variogram object

**Details**

A plot is created on the current graphics device with quantiles of the chi-square distribution on the horizontal axis and ordered values of  $\frac{(Z(s)-Z(s'))^2}{\gamma(s-s')}$  on the vertical axis.

A straight red line marks the expected curve of this plot. Additionally approximate confidence bounds for 10% significance are given.

**Author(s)**

Ernst Glatzer

**References**

E. Glatzer, W.G. Mueller, 2004. Residual diagnostics for variogram fitting. Computers and Geo-sciences 30, pp 859-866.

**See Also**

[PlotDiag.varobj](#)

**Examples**

```
data(tulln)
QQVarcloud.varobj(vs50)
```

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tulln	<i>Data on Chlorid concentrations in the Suedliche Tullnerfeld</i>
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### Description

The tulln dataset contains a variogram object and a matrix with the coordinates of the vertices of a polygonal region.

### Usage

```
data(tulln)
```

### Format

This dataset consists of a variogram object and a matrix.

### Details

The variogram model used is a spherical model.

### Source

Glatzer, E and Mueller, W.G. (2002).

### References

E. Glatzer, W.G. Mueller, 2004. Residual diagnostics for variogram fitting. Computers and Geosciences 30, pp 859-866.

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varobj	<i>Function for variogram fitting</i>
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### Description

This function fits a variogram model to spatial data and calculates some statistics.

### Usage

```
varobj(m, iter = 50, tolerance = 2e-04, trace = 1, loo = FALSE)
```

### Arguments

m	n by 3 matrix with spatial data
iter	this argument is put forward to the optimization routine
tolerance	this argument is put forward to the optimization routine
trace	if set to values higher than 1 some debug messages are given
loo	if set to TRUE, leave-one-out residuals are clculated



### **Details**

Only spherical variogram models are fitted.

### **Value**

a variogram object

### **Author(s)**

Ernst Glatzer

### **References**

E. Glatzer, W.G. Mueller, 2004. Residual diagnostics for variogram fitting. Computers and Geosciences 30, pp 859-866.

### **See Also**

[PlotDiag.varobj](#)

### **Examples**

```
data(tulln)
```

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