



AHELP for CIAO 3.4

# grpMaxSlope

Context: group

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## Synopsis

Group an array so that its absolute gradient is above a user-defined limit.

## Syntax

```
grpMaxSlope( Array_Type axisArray, Array_Type dataArray, Double_Type
slope )
grpMaxSlope( Array_Type axisArray, Array_Type dataArray, Double_Type
slope, Integer_Type maxLength )
grpMaxSlope( Array_Type axisArray, Array_Type dataArray, Double_Type
slope, Integer_Type maxLength, Array_Type tabStops )
Returns: ( Array_Type grouping, Array_Type quality )
```

## Description

In this routine, groups are created when the absolute value of the slope of the input data (the axisArray and binArray arguments) is less than the threshold value (the slope argument). The slope is calculated as

$$\frac{\text{delta}[\text{dataArray}]}{\text{delta}[\text{axisArray}]}$$

The optional parameters maxLength and tabStops represent the maximum number of elements that can be combined and an array representing those elements that should be ignored respectively.

This function provides the same functionality as the MAX\_SLOPE option of dmgroup.

## Example 1

```
chips> (g,q) = grpMaxSlope( x, y, 2 )
```

This example calculates the grouping and quality arrays that represent the input data (here the contents of the x and y arrays) in groups in which the slope is more than 2.

## Example 2

```

chips> x = [1:10]
chips> y = [1, 2, 10, 1, 1, 20, 40, 80, 20, 2 ]
chips> (g,q) = grpMaxSlope( x, y, 2 )
chips> ysum = grpGetGroupSum( y, g )
chips> nchan = grpGetChansPerGroup( g )
chips> i = where( g == 1 )
chips> yavg = ysum[i] / nchan[i]
chips> curve( x, y )
chips> simpleline
chips> curve( x[i], yavg )
chips> symbol square
chips> symbol red

```

Here we take a dataset and group it so that the resulting groups differ by a slope at least 2. The plot shows the original data (the solid line and the crosses) and the grouped data (as the red squares); the latter has been normalised by the width of each group and is displayed at the left-edge of each group.

## Bugs

See the [bugs page for the group library](#) on the CIAO website for an up-to-date listing of known bugs.

## See Also

*group*

[grpadaptive](#), [grpadaptivesnr](#), [grpbin](#), [grpbinfile](#), [grpbinwidth](#), [grpgetchanspergroup](#), [grpgetgroupsum](#), [grpgetgrpnum](#), [grpmaxslope](#), [grpminslope](#), [grpnumbins](#), [grpnumcounts](#), [grpsnr](#)

*modules*

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URL:  
<http://cxc.harvard.edu/ciao3.4/grpmaxslope.html>  
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