

**NAME**

**mbrollbias** – Assess roll bias of swath sonar systems.

**VERSION**

Version 5.0

**SYNOPSIS**

**mbrollbias** **-F***format1/format2* **-L***lonflip* **-I***file1* **-J***file2* **-R***west/east/south/north* [**-D***xdim/ydim* **-H** **-V**]

**DESCRIPTION**

**mbrollbias** is a utility used to assess roll bias of swath sonar systems using bathymetry data from two swaths covering the same seafloor in opposite directions. The program takes two input files and calculates best fitting planes for each dataset. The roll bias is calculated by solving for a common roll bias factor which explains the difference between the seafloor slopes observed on the two swaths. This approach assumes that pitch bias is not a factor; this assumption is most correct when the heading of the two shiptracks are exactly opposite. The area is divided into a number of rectangular regions and calculations are done in each region containing a sufficient number of data from both swaths. The data contained in the two datafiles should be processed to ensure that no artifacts will bias the roll bias calculations. Typically, this means using **mbclean** and or **mbedit** to remove noisy outer beams. A positive roll bias value means that the the vertical reference used by the swath sonar system is biased to starboard, giving rise to shallow bathymetry to port and deep bathymetry to starboard. Results are written to stdout.

**MB-SYSTEM AUTHORSHIP**

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**OPTIONS**

- F** *format1/format2*  
Sets the **MBIO** format identifiers for the first and second data files, respectively. This program uses the **MBIO** library and will read or write any swath sonar format supported by **MBIO**. A list of the swath sonar data formats currently supported by **MBIO** and their identifier values is given in the **MBIO** manual page.
- D** *xdim/ydim*  
The area specified using the **-R** option is divided up into a grid of rectangular regions; roll bias calculations are done in each of these regions providing sufficient data is available from both data files. This option sets the dimensions of the region grid. Use *xdim* = *ydim* = 1 to make one calculation for the entire area. Default: *xdim* = *ydim* = 1.
- H** This "help" flag cause the program to print out a description of its operation and then exit immediately.
- I** *file1*  
Sets the filename of the first data file to be analyzed.
- J** *file2*  
Sets the filename of the second data file to be analyzed.

- L**     *lonflip*  
Sets the range of the longitude values returned. If *lonflip*=-1 then the longitude values will be in the range from -360 to 0 degrees. If *lonflip*=0 then the longitude values will be in the range from -180 to 180 degrees. If *lonflip*=1 then the longitude values will be in the range from 0 to 360 degrees. Default: *lonflip* = 0.
- R**     *west/east/south/north*  
Sets the longitude and latitude bounds of the area of the roll bias test.
- V**     The **-V** option causes the program to print out the program name and version during execution.

### EXAMPLE

Suppose you want to calculate roll bias using two coincident swaths of Hydrosweep DS data collected in nearly opposite directions. Run **mbrollbias** as follows:

```
mbrollbias -R-51.07/-50.98/9.0166/9.117 -D1/1 -F22/22
-lhs_leg1_z.mb22 -Jhs_leg2_z.mb22 -V
```

The output looks like:

```
Program mbrollbias
MB-system Version 4.00
```

mbrollbias Parameters:

Input file 1:   hs\_leg1\_z.mb22

Input file 2:   hs\_leg2\_z.mb22

Region grid bounds:

Longitude: -51.0700 -50.9800

Latitude:   9.0166   9.1170

Region grid dimensions: 1 1

Longitude interval: 0.090000 degrees or 9.894392 km

Latitude interval: 0.100400 degrees or 11.104426 km

Longitude flipping:   0

4840 depth points counted in hs\_leg1\_z.mb22

1733 depth points counted in hs\_leg2\_z.mb22

4840 depth points read from hs\_leg1\_z.mb22

1733 depth points read from hs\_leg2\_z.mb22

Region 0 (0 0) bounds:

Longitude: -51.0700 -50.9800

Latitude:   9.0166   9.1170

First data file:   hs\_leg1\_z.mb22

Number of data: 4840

Mean heading:   107.845062

Plane fit:    4.759709 -0.002327 -0.004623

Second data file:   hs\_leg2\_z.mb22

Number of data: 1733

Mean heading:   302.022793

Plane fit:    4.640304 0.008438 0.008494

Roll bias: -0.007288 (-0.417598 degrees)

Roll bias is positive to port, negative to starboard.

A positive roll bias means the ship rolls to port,  
giving rise to shallow bathymetry to port and  
deep bathymetry to starboard.

**SEE ALSO**

**mbsystem**(1)

**BUGS**

Probably.