

ATLANTIS EM122 CALIBRATION NOTES

Multibeam Advisory Committee (2017-03-21)

Initial calibration data collected 2017-03-19 during transit and processed on shore in Qimera

SIS motion sensor angles set to zero before data collection

PHINS configuration modified to correct the IMU pitch angle sign error identified in late 2016

PHINS IMU installation angles heading into calibration:

Lever arm settings

✓ [Angular and linear orientation](#)

Vessel misalignment

Heading (°) 0.000
Roll (°) -0.412
Pitch (°) 0.142

Primary lever arm

Length XV1 (m) 0.000
Length XV2 (m) 0.000
Length XV3 (m) 0.000

Secondary lever arm

	A	B	C
Length XV1 (m)	0.000	0.000	0.000
Length XV2 (m)	0.000	0.000	0.000
Length XV3 (m)	0.000	0.000	0.000

Orientation

Vessel XV1 (Prow) Connectors side
Vessel XV2 (Port) Right side
Vessel XV3 (Up) Top side

✓ [COG lever arm](#)

✓ [GPS lever arm](#)

Length XV1 (m) -10.140
Length XV2 (m) 3.410
Length XV3 (m) 27.468

✓ [GPS2 lever arm](#)
✓ [Manual GPS lever arm](#)
✓ [DVL lever arm and misalignment](#)
✓ [LogEM lever arm](#)
✓ [Depth lever arm](#)
✓ [USBL lever arm](#)
✓ [LBL lever arm](#)

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CALIBRATION DATA COLLECTION

Calibration lines were collected near a marine slump site offshore Puntarenas, CR

The lines were run in order of Pitch, Yaw, Roll in order to save transit time

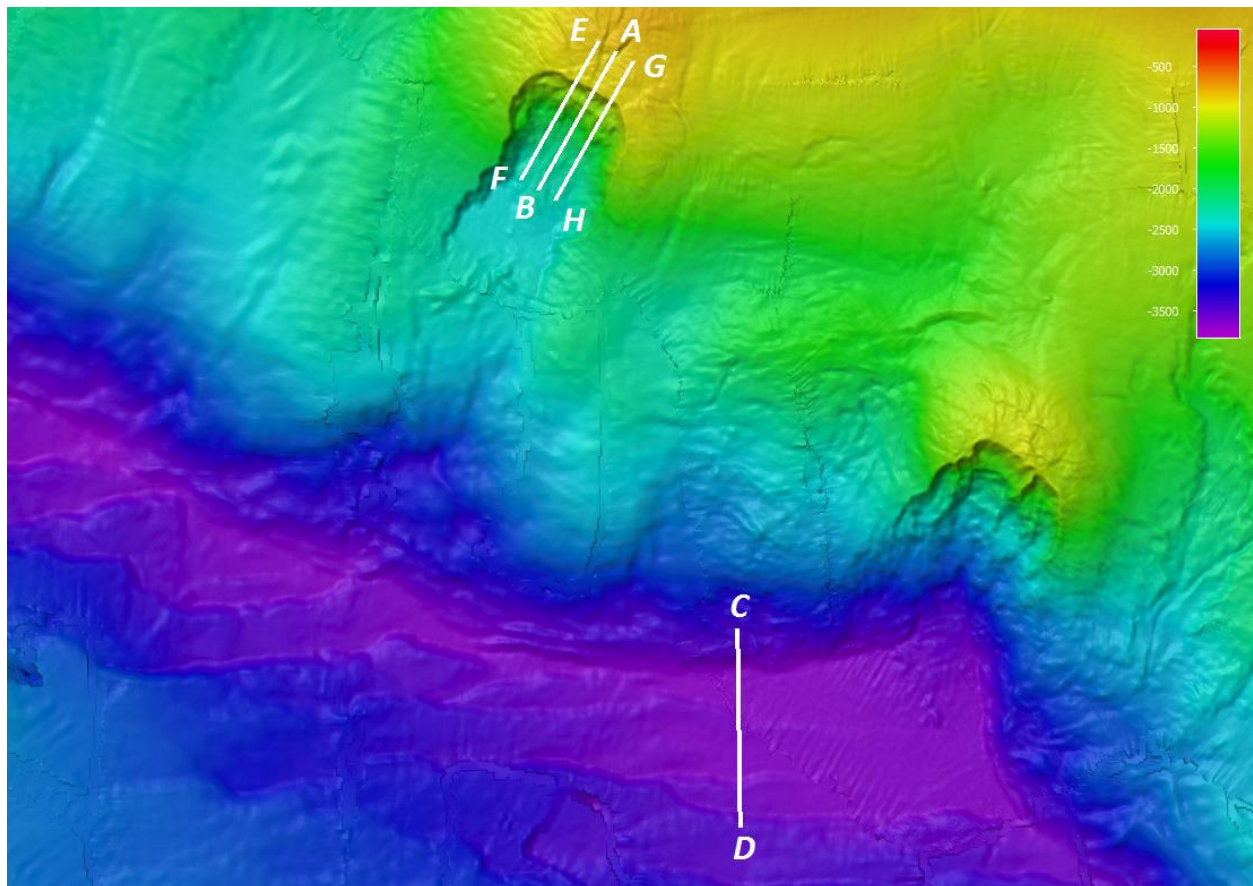
No installation angle changes were made between lines

Pitch: A-B on opposite headings at 6 kts

Roll: C-D on opposite headings at 6 kts

Yaw: E-F and G-H on same heading at 6 kts

See Excel spreadsheet 'ATL_EM122_20170313_calibration_plan' for speeds and EM122 settings, etc.



Waypoints (Lat/Lon WGS84)

A	9.148201115	-84.814620473
B	9.085797163	-84.851375921
C	8.885191158	-84.764726772
D	8.794808725	-84.765271789
E	9.152767741	-84.822469579
F	9.090362802	-84.859224504
G	9.143634364	-84.806771593
H	9.081231401	-84.843527564

INITIAL CALIBRATION RESULTS

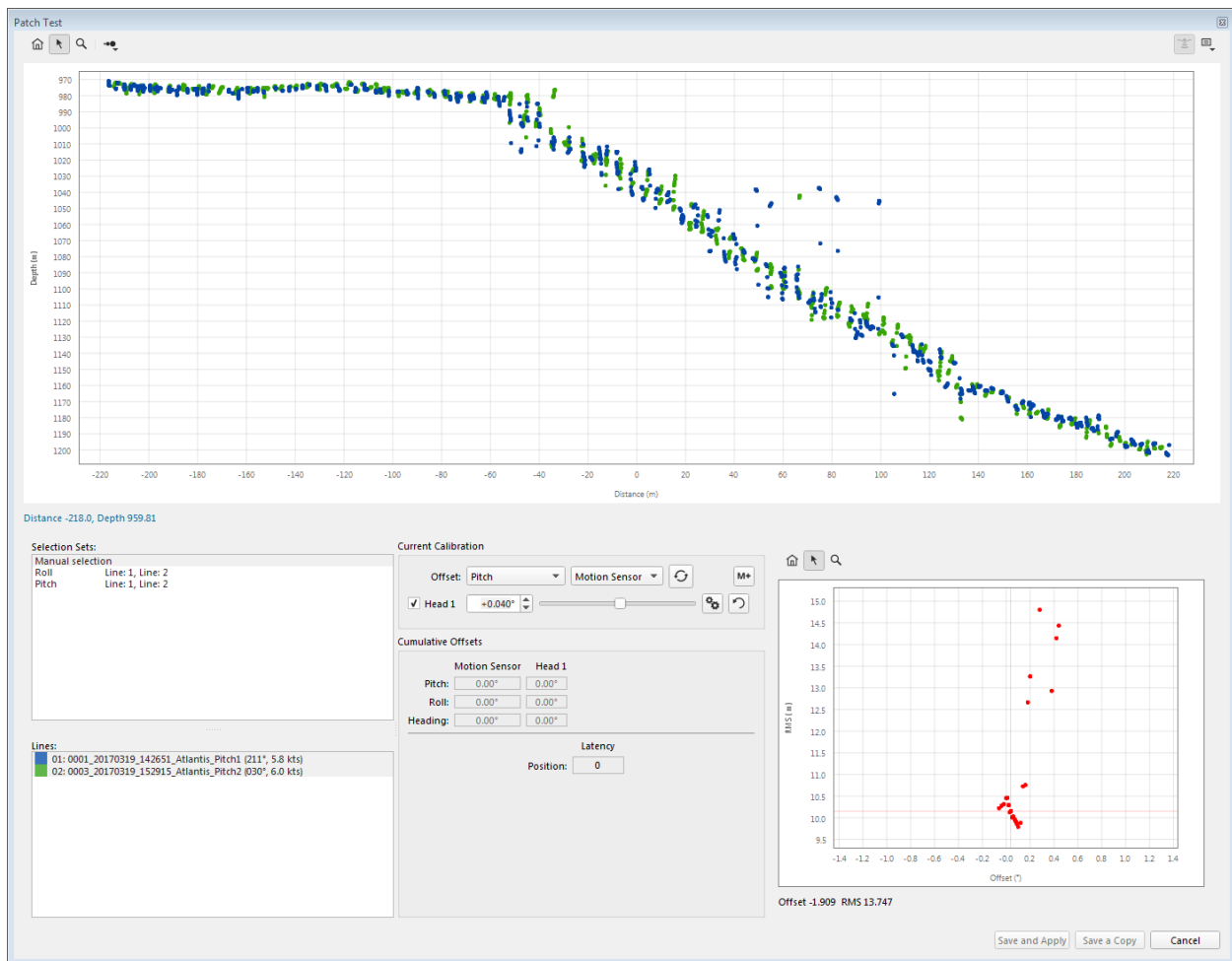
Verification not completed due to long-period bathymetry artifacts correlated with yaw of vessel.

The data were analyzed in the traditional order of pitch, roll, then yaw, with offsets applied in post-processing after each test. This is suitable for an initial calibration and will require verification after correction of the long-period artifact correlated with yaw.

Pitch (with zero yaw/roll applied in Qimera)

Files: 0001 and 0003

Initial result to enter in SIS Motion 1 Pitch: +0.04°

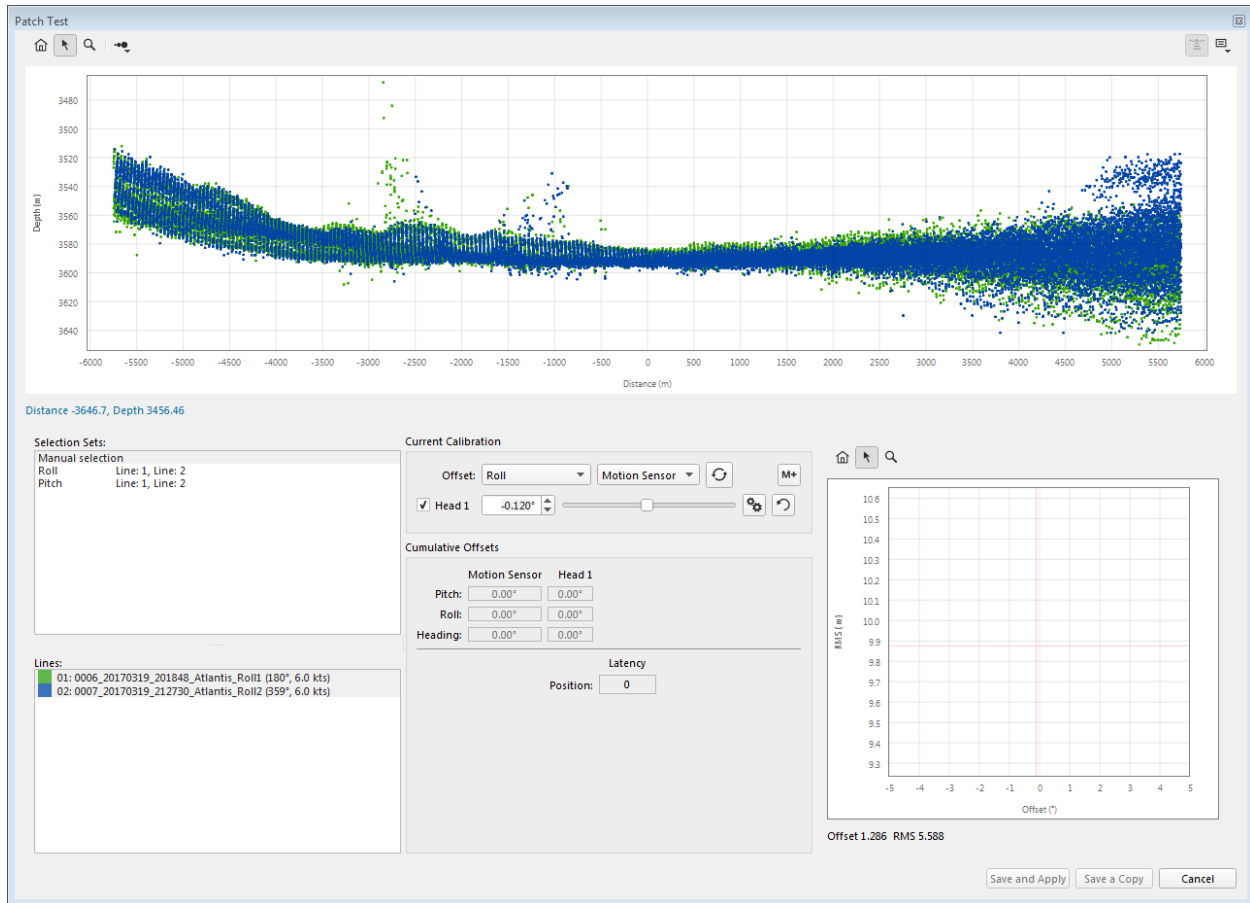


Roll (with +0.04 pitch applied in Qimera)

Files: 0006 and 0007

Initial result to enter in SIS Motion 1 Roll: -0.12°

Note: a very large sounding subset was required to 'average out' the bathymetry artifacts over many periods and estimate a mean roll offset; using a more traditional, narrow sounding subset makes the roll estimate much more vulnerable to the amplitude of the bathymetry artifact in that narrow subset.



Yaw (with +0.04 pitch and -0.12 roll applied in Qimera)
Files: 0004 and 0005

Initial result to enter in SIS Motion 1 Heading: -0.02°

