



ARK-XXII/1 processing log

MARUM QUEST ROV-Navigation data

a) Original data

The navigation data was extracted from the DSHIP data base of the MARUM QUEST ROV system, installed on board of R/V "Polarstern" during the legs 1b and 1c. The original data is held on hard drive on the DSHIP data base. The data set contains 15 data files with 1-second-interval data, 15 with 10-second-interval data with the navigation of one ROV dive.

The Raw data are:

- USBL position from IXSEA Posidonia 6000 USBL system
- Speed from DVL navigation doppler RDI 1200 kHz
- Heading from TCM2 compass
- Immersion from pressure sensor
- Altitude from altimeter

b) Processing

I. Processing steps:

1. Extraction of source data from DSHIP data base
2. Importing navigation data to Adelle GIS via dbf tables
3. Manual editing of erroneous positions with Adelle GIS tools
4. Automatic filtering of navigation by speed and immersion with Adelle GIS tools
5. Export of edited navigation to ascii tables

II. Processed data:

Result of the processing is the verified navigation, held in ASCII table (tab delimited) with the following format:

- Column 1: Latitude [decimal degree]
- Column 2: Longitude [decimal degree]
- Column 3: Date [Format: DD.MM.YYYY HH:MM:SS]
- Column 4: Flag
- Column 5: Speed [knots]
- Column 6: Heading [degree]
- Column 7: Altitude [metres]
- Column 8: Immersion [metres]

The flag string consists of four digits with the following meaning:

Digit 1:

- [0]: No position available
- [1]: Position from IXSEA Posidonia USBL
- [2]: Position from JHU DVLNav navigation system

Digit 2:

- [0]: USBL Position is not pitch corrected
- [1]: USBL Position is pitch corrected

Digit 3:

- [0]: USBL Position is not roll corrected
- [1]: USBL Position is roll corrected

Digit 4:

- [0]: USBL Position is not heading corrected
- [1]: USBL Position is heading corrected



The following table gives an overview about all ROV navigation datasets:

General Dive Information					Comment
ABS	REL #	Date	Scientist		
46	164	1	24/06/2007	Feseker	only DVLNav available large navigation uncertainties (up to 500 m) possible
52	165	2	25/06/2007	Wenzhoefer	
89	166	3	29/06/2007	Laurent	
96	167	4	30/06/2007	Ritt	
105	168	5	01/07/2007	Wollenburg	
112	169	6	02/07/2007	Gruenke	
119	170	7	03/07/2007	Bergmann	
125	171	8	04/07/2007	Feseker	
132	172	9	05/07/2007	Felden	
140	173	10	06/07/2007	Wenzhoefer	
156	174	11	11/07/2007	Schewe	
171	175	12	13/07/2007	Sauter	Tx deformation, pitch offset of approx. 9.05 deg NOT corrected large navigation uncertainties (up to 500 m) possible
177	176	13	14/07/2007	Knust	Tx deformation, pitch offset of approx. 9.05 deg NOT corrected large navigation uncertainties (up to 500 m) possible
208	177	14	19/07/2007	-	Tx deformation, pitch offset of approx. 9.05 deg corrected large navigation uncertainties (up to 500 m) possible
215	178	15	20/07/2007	Guilini	Tx deformation, pitch offset of approx. 9.05 deg corrected large navigation uncertainties (up to 500 m) possible

III. Statistic

Data volume 1-second-interval data:	41 MB
Data volume 10-second-interval data:	4 MB
First data:	24.06.2007 13:40:00
Last data:	20.07.2007 22:10:00
Total number of positions after processing:	554939
Total number of DVLNav positions (Digit 1 = 2):	19861 (3.58 percent)
Total number of positions without pitch correction:	71978 (12.97 percent)
Total number of positions without roll correction:	71978 (12.97 percent)
Total number of positions without heading correction:	71978 (12.97 percent)