



ARK-XXII/1 processing log

Navigation data

a) Original data

The navigation data was extracted from the DSHIP data base PODAS on board of R/V "Polarstern". The original data is held on magnetic tapes as a backup of the DSHIP database. The data set contains 114 data files (57 with 1-second-interval data, 57 with 10-second-interval data), each with the navigation of one day.

The Raw data are:

- GPS position from TRIMBLE MS750 GPS
- Speed from MINS ringlaser gyro
- Heading from MINS ringlaser gyro
- Depth from multibeam sonar system Atlas Hydrosweep DS2

b) Processing

I. Processing steps:

1. Extraction of source data from DSHIP data base
2. Centering of the position of the GPS Antenna to the ships reference point
3. Automatic filtering of erroneous positions by comparing the positions of the two GPS Antennas
4. Visual control and editing of navigation data

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: Depth [metres]

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

Digit 1:

- [0]: No position available
- [1]: Position based on sensor TRIMBLE 1
- [2]: Position based on sensor TRIMBLE 2

Digit 2:

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

Digit 3:

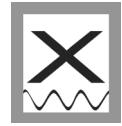
- [0]: Position is not roll corrected
- [1]: Position is roll corrected

Digit 4:

- [0]: Centering is based on heading from GPS data (less accurate)
- [1]: Centering is based on heading from Motion-Reference-Unit

III. Statistic

Data volume 1-second-interval data:	308 MB
Data volume 10-second-interval data:	31 MB
First data:	29.05.2007 12:00:00
Last data:	25.07.2007 07:20:00
Total number of positions after processing:	4691732
Total number of TRIMBLE 2 positions (Digit 1 = 2):	8632 (0.18 percent)
Total number of positions without pitch correction:	7775 (0.17 percent)



Total number of positions without roll correction:	7775 (0.17 percent)
Total number of positions with GPS heading correction:	7775 (0.17 percent)
Total number of invalid GPS data	0 (0 percent)