



FLUVIA NAUTIC DATASET

(16 March 2007)

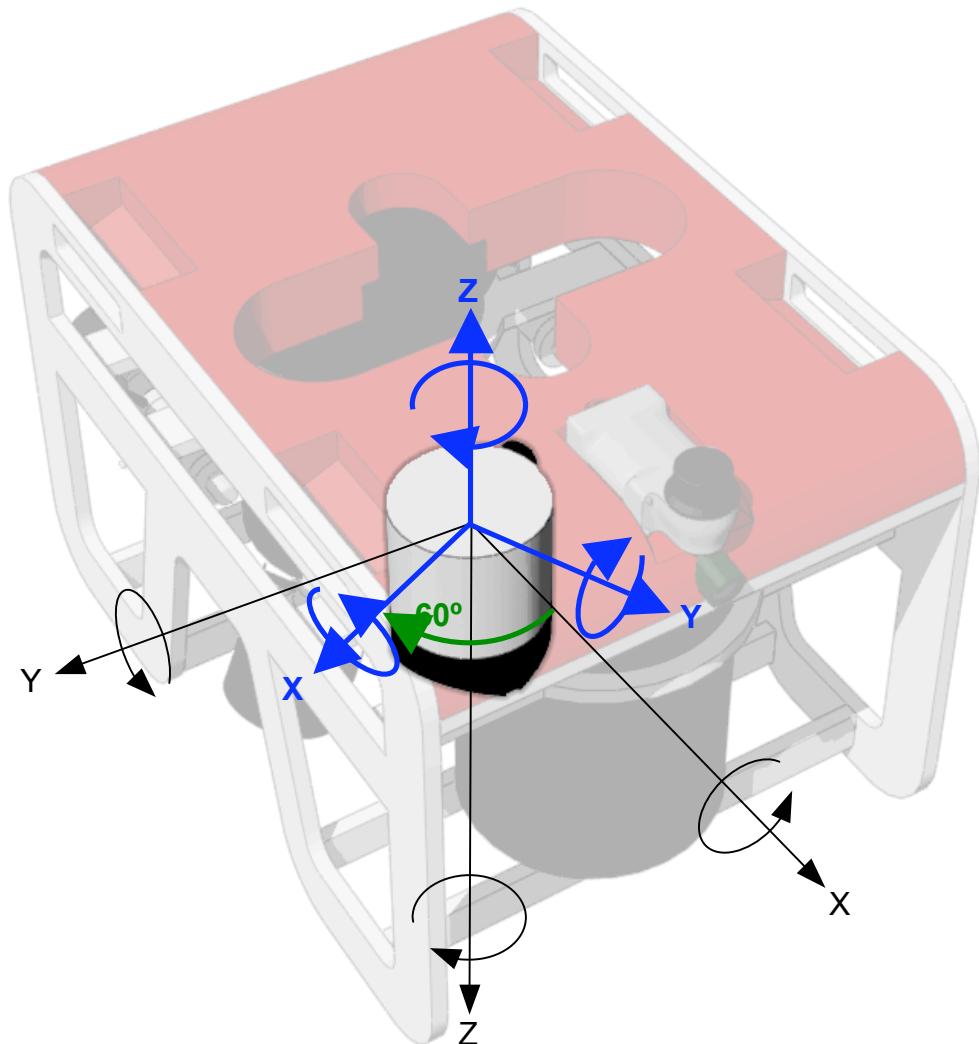
Description of the sensor logs

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Doppler Velocity Log (Argonaut DVL, SonTek)



The blue reference frame represents the positive directions (linear and angular) of the measurements from the DVL sensor. The black reference frame corresponds to the vehicle.

The columns in the DVL log file are organized as follows:

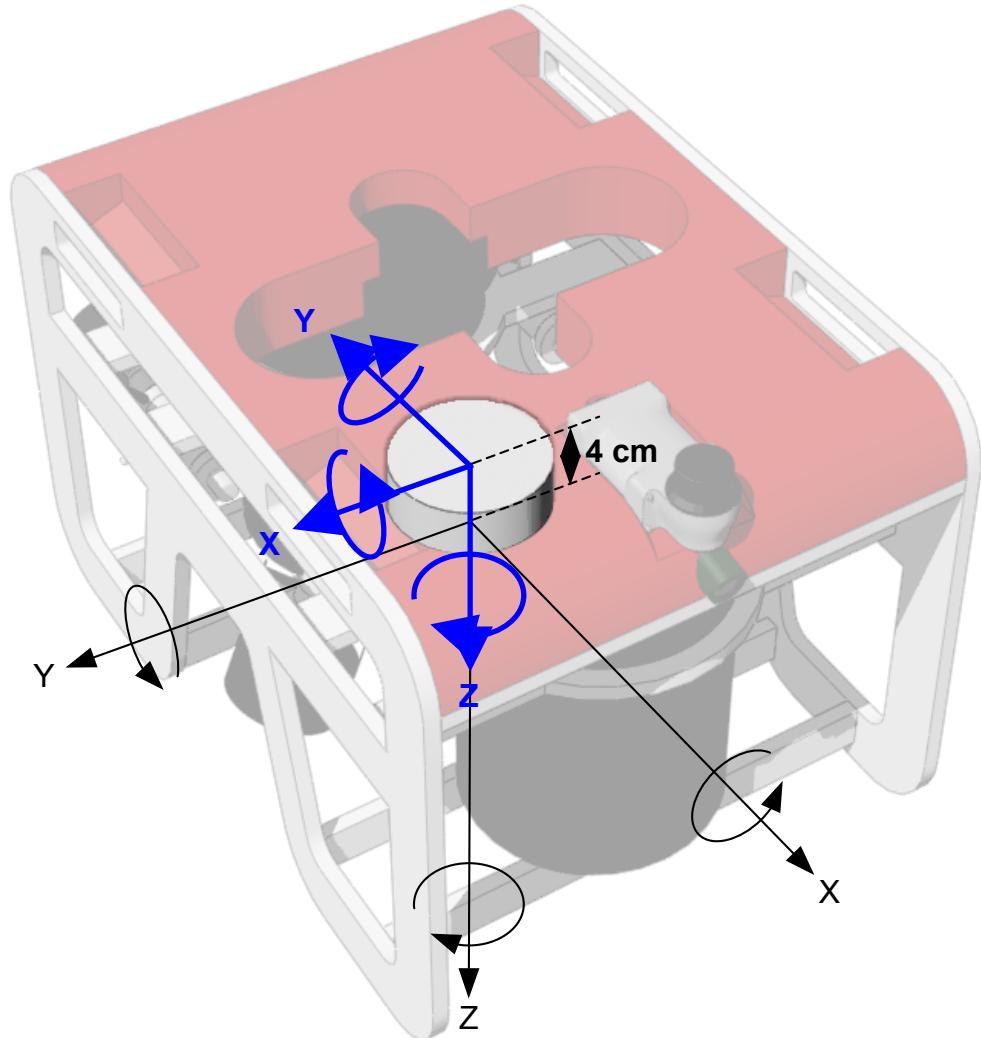
Column	Content	Unit
1	Log time	s
2	Sensor time – Year	year
3	Sensor time – Month	month
4	Sensor time – Day	day
5	Sensor time – Hour	hour
6	Sensor time – Minute	minute
7	Sensor time – Second	s
8	Velocity with respect to the water in the X direction	cm/s
9	Velocity with respect to the water in the Y direction	cm/s
10	Velocity with respect to the water in the Z direction	cm/s
11	Water velocity status (0 = no measurement, 1 = Ok)	

12	Velocity with respect to the bottom in the X direction	cm/s
13	Velocity with respect to the bottom in the Y direction	cm/s
14	Velocity with respect to the bottom in the Z direction	cm/s
15	Bottom velocity status (0 = no measurement, 1 = Ok)	
16	Range to bottom (beam 1)	m
17	Range to bottom (beam 2)	m
18	Range to bottom (beam 3)	m
19	Amplitude (beam 1)	
20	Amplitude (beam 2)	
21	Amplitude (beam 3)	
22	Percent good pings	
23	Yaw (rotation about Z-axis)	deg
24	Pitch (rotation about Y-axis)	deg
25	Roll (rotation about X-axis)	deg
26	Mean temperature	deg C
27	Mean pressure	counts *
28	Input power level	V
29	Starting location of sampling volume (vertical distance)	m
30	Ending location of sampling volume (vertical distance)	m
31	Distance travel X	m
32	Distance travel Y	m

* Pressure in counts is converted to decibar using the following formula:

$$(d\text{bar}) = 0.00377225(\text{counts}) - 4.43146$$

Motion Reference Unit (MTi, Xsens)

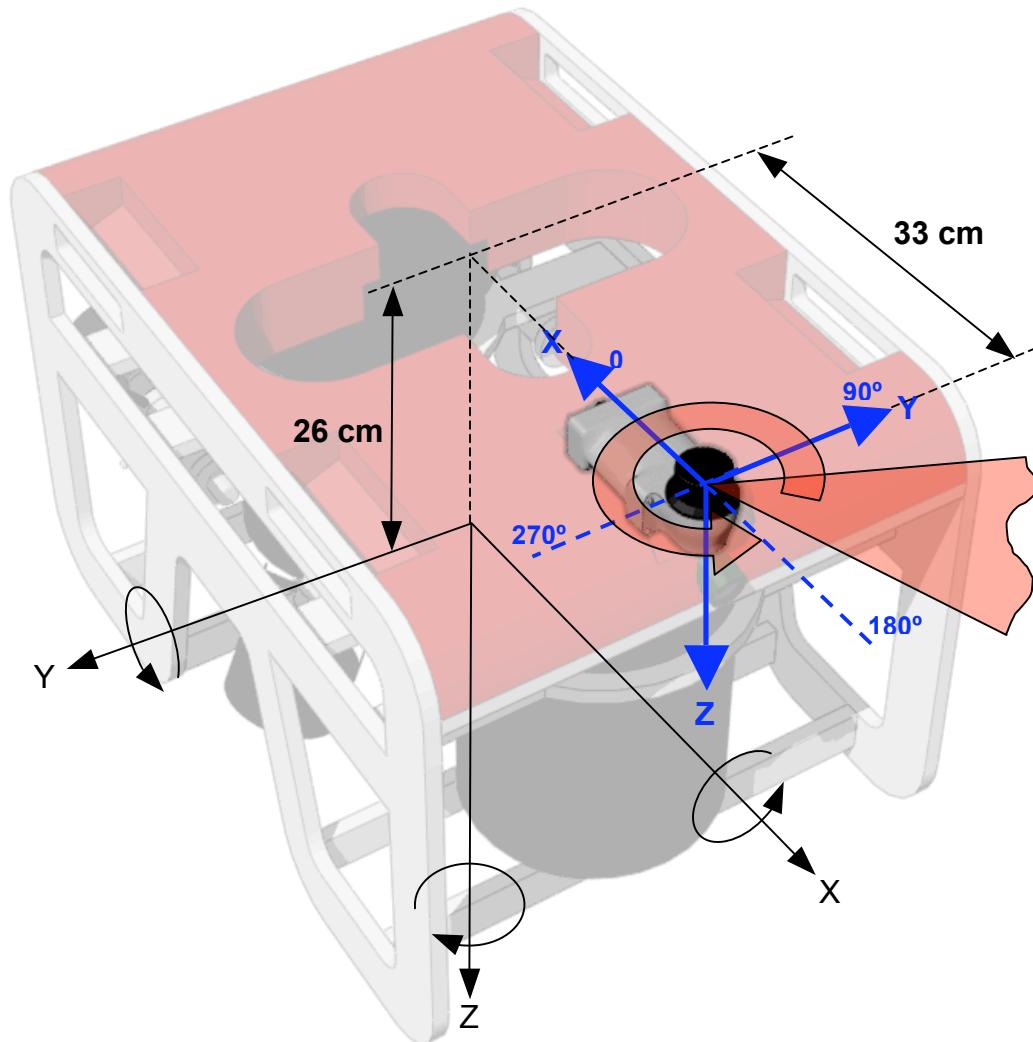


The blue reference frame represents the positive directions (linear and angular) of the measurements from the MTi sensor. The black reference frame corresponds to the vehicle.

The columns in the MTi log file are organized as follows:

Column	Content	Unit
1	Log time	s
2	Roll (rotation about X-axis)	deg
3	Pitch (rotation about Y-axis)	deg
4	Yaw (rotation about Z-axis)	deg
5	Rate of turn (rotation about X-axis)	rad/s
6	Rate of turn (rotation about Y-axis)	rad/s
7	Rate of turn (rotation about Z-axis)	rad/s
8	Acceleration (X-axis)	m/s ²
9	Acceleration (Y-axis)	m/s ²
10	Acceleration (Z-axis)	m/s ²

Imaging sonar (Miniking, Tritech)

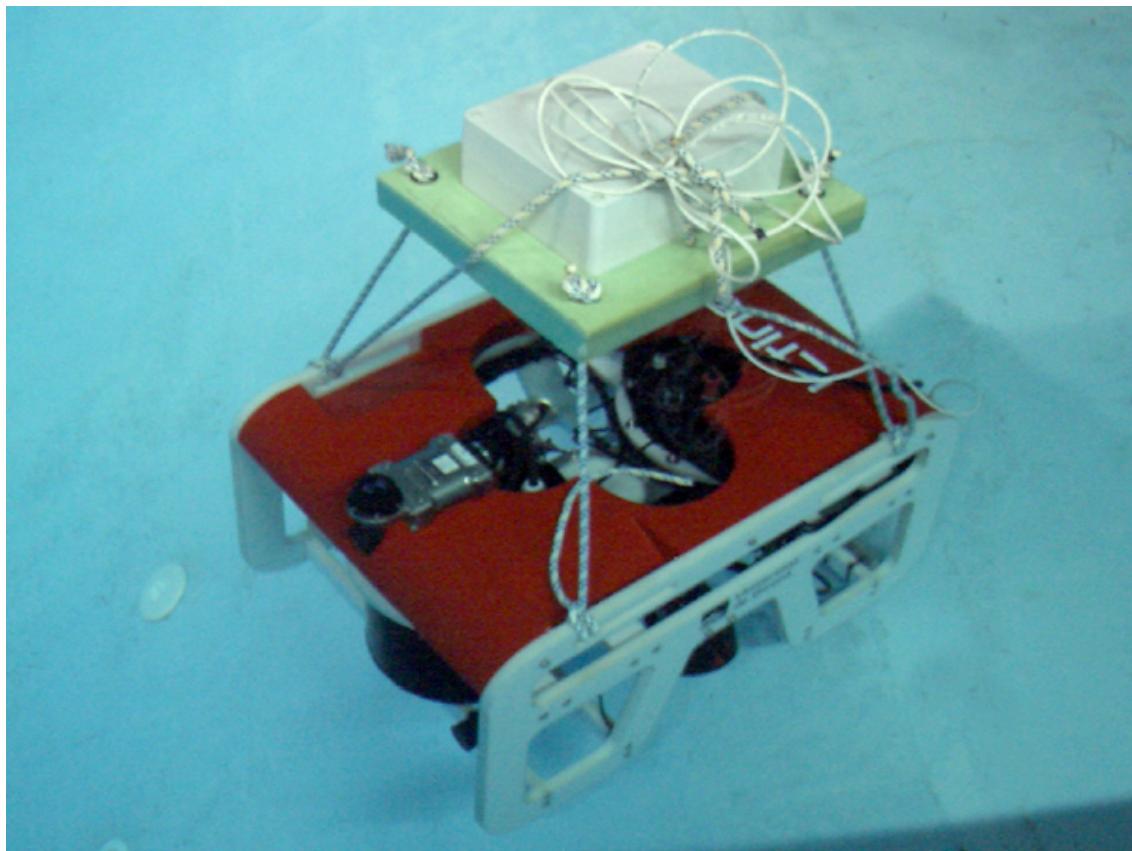


The blue reference frame corresponds to the Miniking imaging sonar while the black reference frame corresponds to the vehicle. The beam and the turn direction of the transducer head are represented in red. For the experiments, the sensor was set to a range of 50 m with a resolution of 0.1 m (Hence, each beam is represented by a 500 bin vector).

The columns in the Miniking log file are organized as follows:

Column	Content	Unit
1	Log time	s
2	Sensor time	s
3	Transducer head angle (rotation about Z-axis)	deg
4 - 503	Vector of echo intensity returns (bins)	8 bits

DGPS



A DGPS unit mounted in a buoy was attached at the top of the vehicle during the experiments.

The columns in the DGPS log file are organized as follows:

Column	Content	Unit
1	Log time (During the gathering of the dataset this sensor was not perfectly synchronized with the log times of the rest of the sensors. An error of a few seconds is expected)	s
2	Latitude	deg min . fraction of a min
3	Longitude	deg min . fraction of a min
4	Status (1=only GPS 2=DGPS available),	
5	Altitude	m
6	Geoide altitude	m
7	True course	deg
8	Magnetic course	deg
9	Speed	knots
10	Speed	km/h