

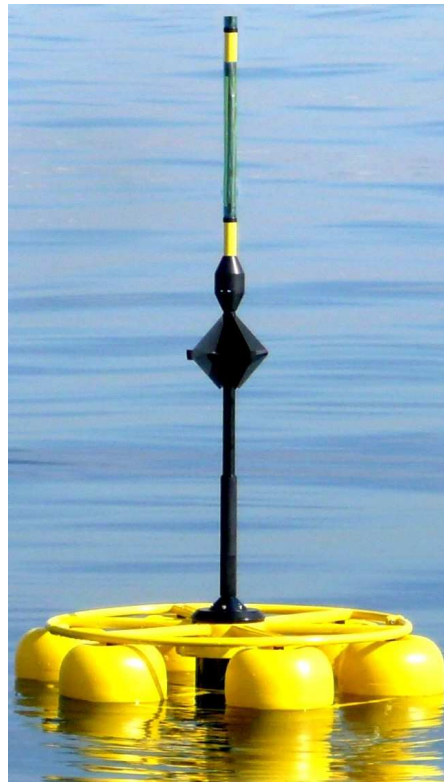
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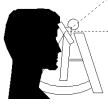
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**GIB-PLUS PORTABLE TRACKING SYSTEM  
AT SEA DEMONSTRATION  
August 2<sup>nd</sup>, 2010**





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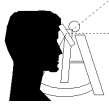
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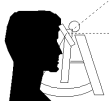
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<i>Precise: A = for action, I = for information</i>	

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Index	Date	Modifications
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## 1. Presentation

The aim of this document is to describe the at-sea demonstration of ACSA's GIB-PLUS tracking system which has been conducted on August, the 2<sup>nd</sup>, 2010 near Hyères.

## 2. Demonstration presentation

### 2.1 Demonstration objectives

The University of Gdansk wished to evaluate GIB tracking stability and accuracy in shallow water.

### 2.2 Site

The demonstration site was in the Hyères bay.

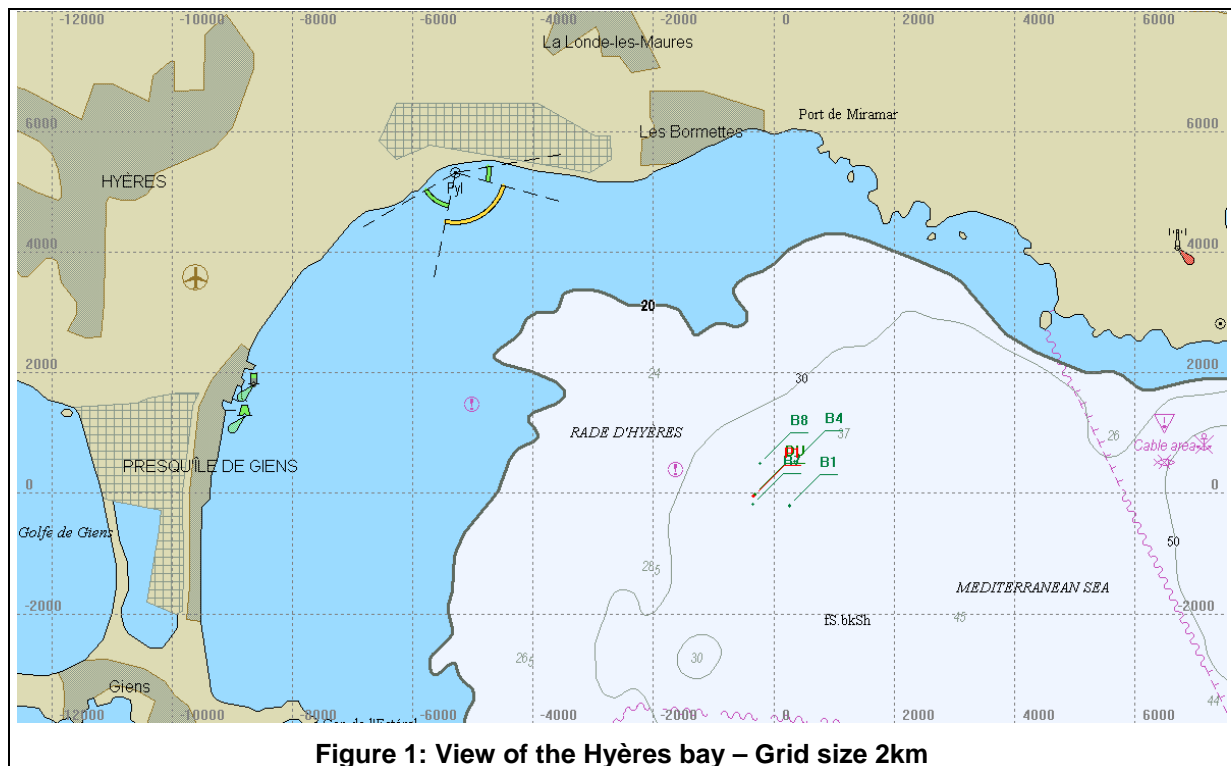


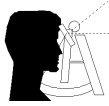
Figure 1: View of the Hyères bay – Grid size 2km

### 2.3 Attendees

ACSA: Camille Béchaz, Lionel Uzan

University of Gdansk: Juliusz Gajewski

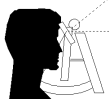
ISE: Richard Mills



### **3. Equipment used**

ACSA provides a complete GIB-PLUS system including:

- 4 GIB-PLUS buoys
- 1 pinger at 10.5 kHz frequency
- 1 GIB Deck Unit (Aerial module + Junction box)
- 1 laptop PC with AQUATIC tracking software



## 4. Daily reports

Remark: All the time are given in GPS time.

06:50 Leave the harbour

07:09 First buoy (B8) deployed

07:14 Second buoy (B4) deployed

07:20 Third buoy (B1) deployed

07:25 Fourth buoy (B7) deployed

**Total time of deployment: 16 minutes**

07:33 Pinger at sea

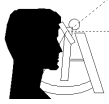
08:22 B1 recovered

08:27 B7 recovered

08:32 B8 recovered

08:38 B4 recovered

**Total recovery time: 16 minutes**



## 5. Demonstration results

### 5.1 Deployment

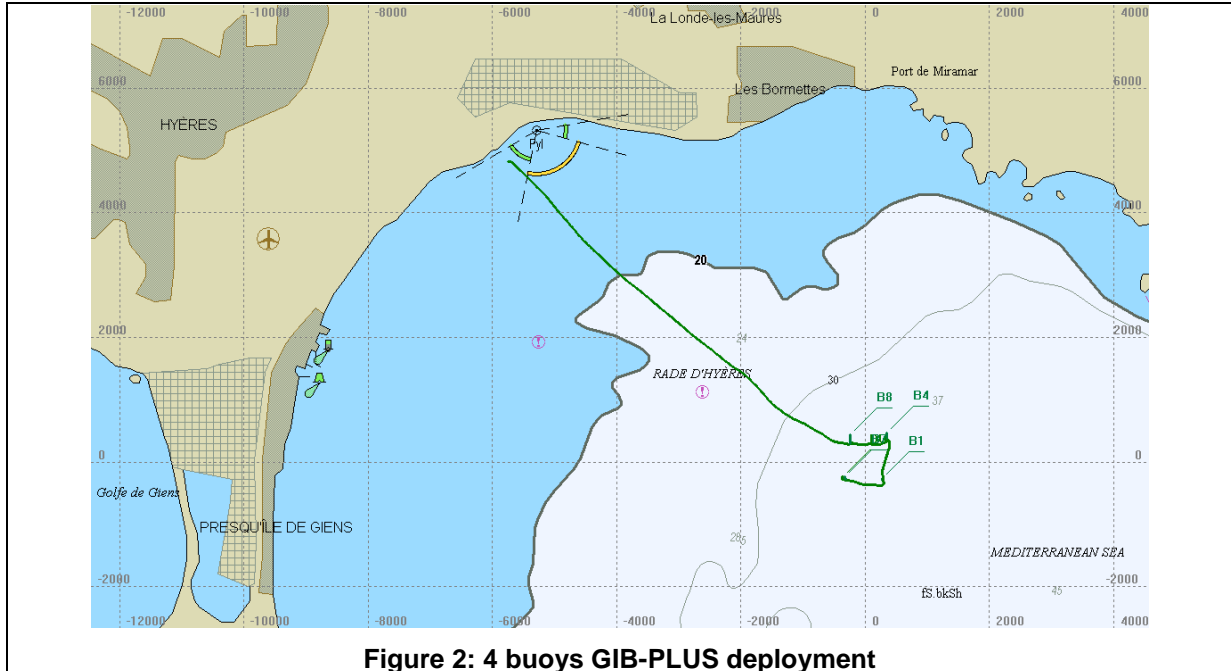


Figure 2: 4 buoys GIB-PLUS deployment

The 4 buoys were deployed in a square of 600 meters (roughly) side.

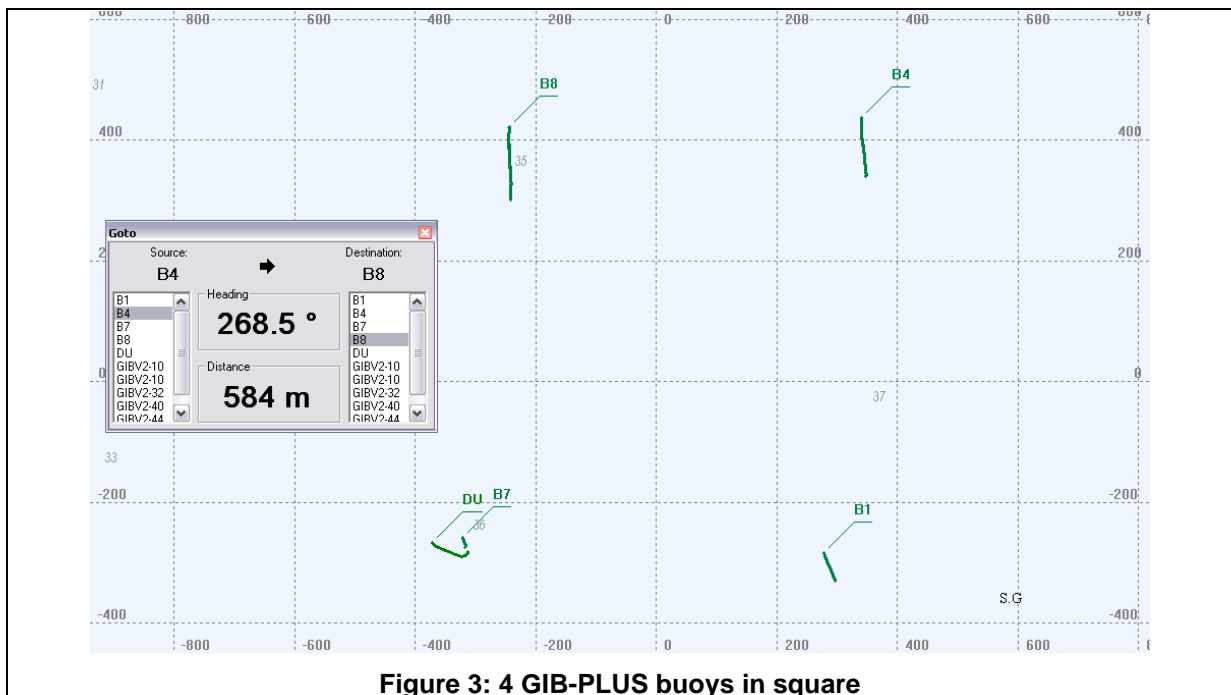
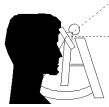


Figure 3: 4 GIB-PLUS buoys in square



## 5.2 Tracking

The following figure shows the 4 buoys (in green), the GPS position of the boat (Green DU) and the acoustic emitter position (calculated) of the pinger towed by the ship (red P1).

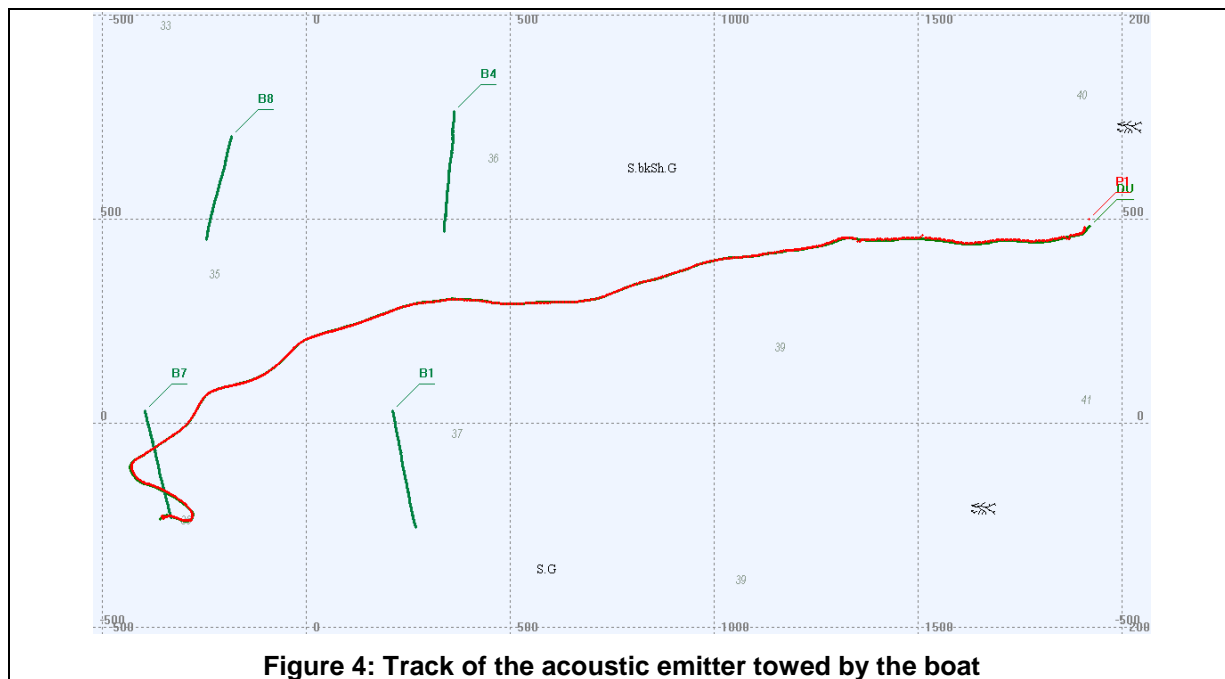


Figure 4: Track of the acoustic emitter towed by the boat

This figure shows that the pinger may track inside and also outside the buoys' network. The pinger was brought at a distance of about 1600 meters of the East side of the buoy pattern.

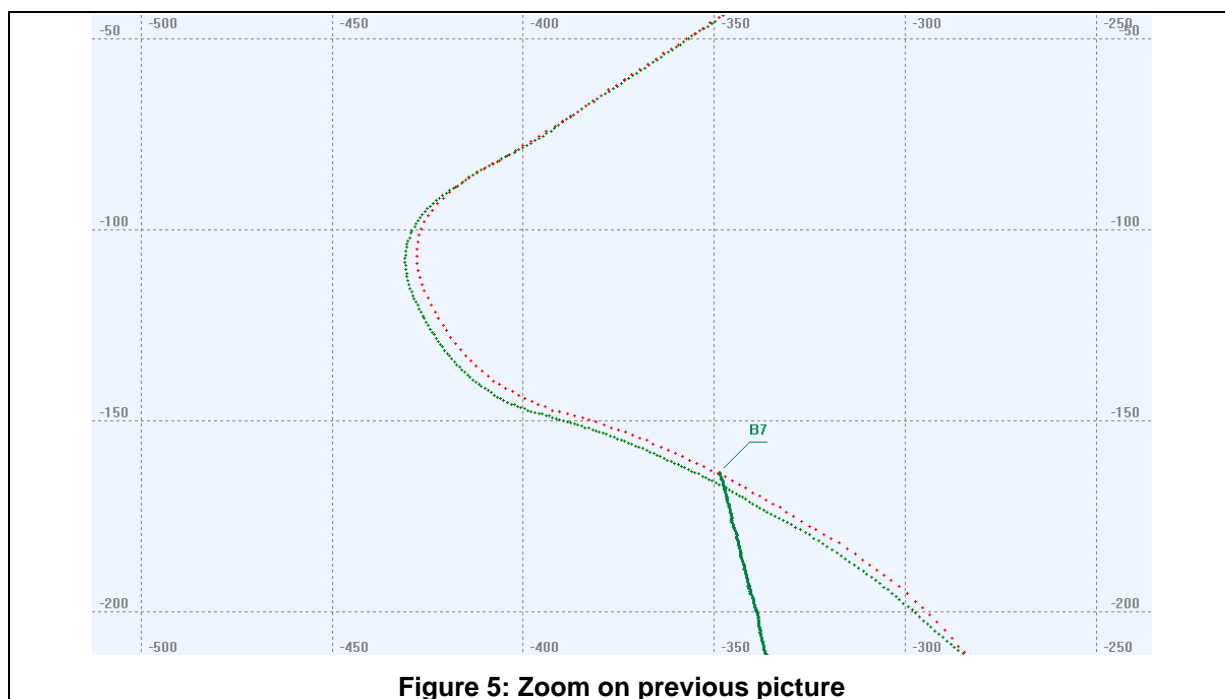


Figure 5: Zoom on previous picture



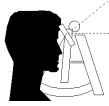
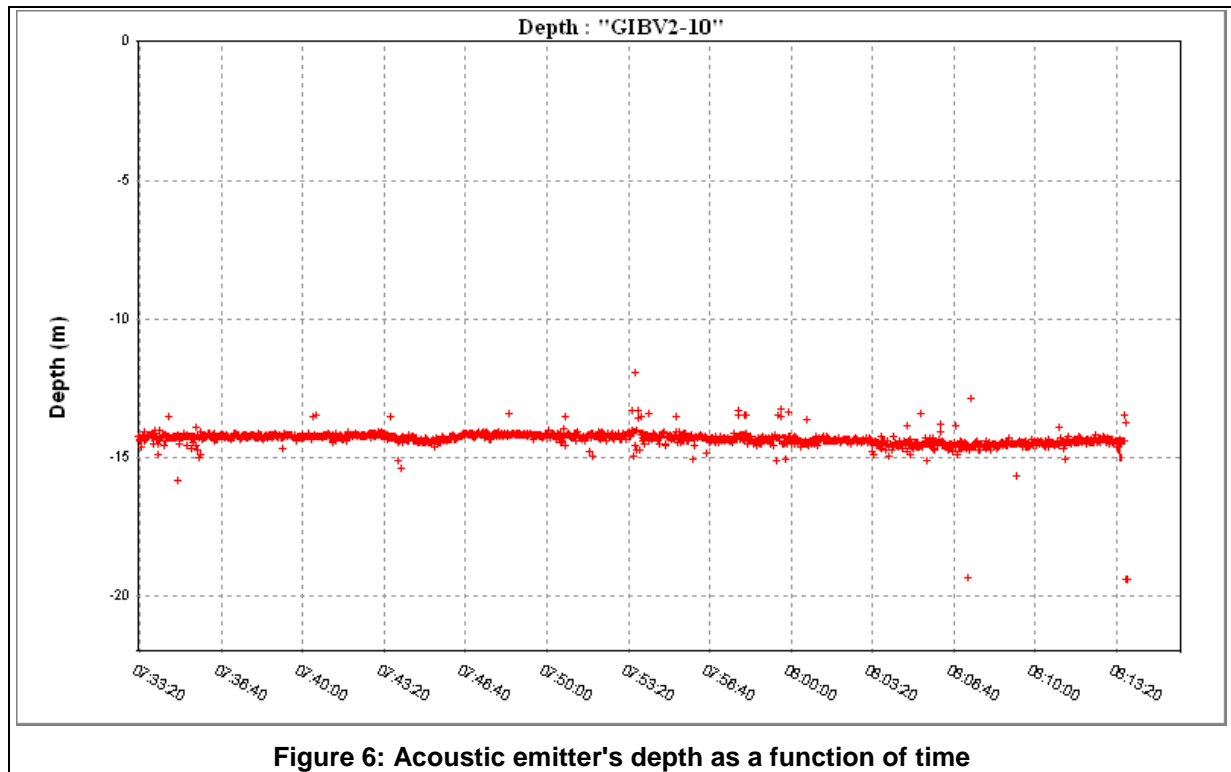


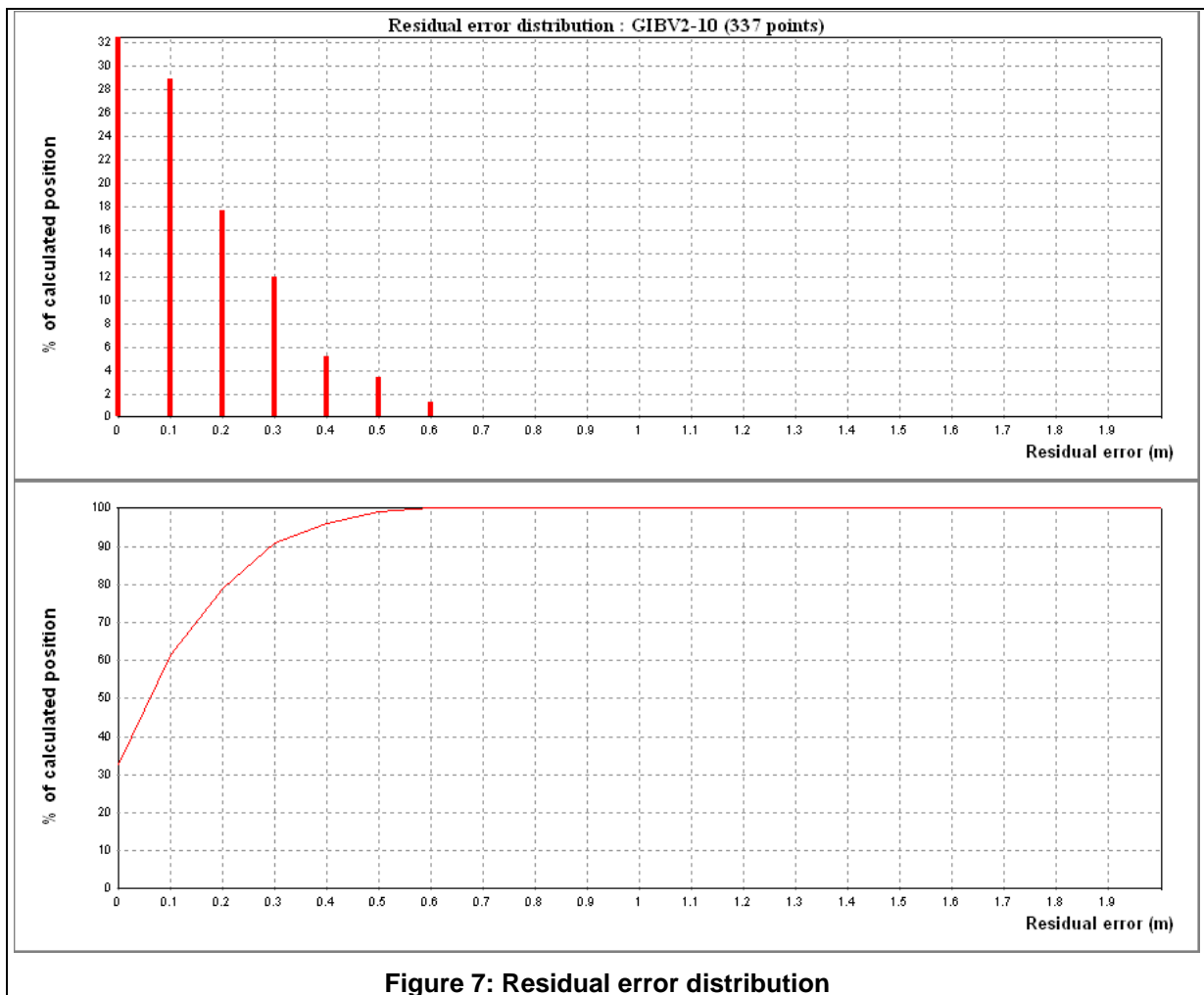
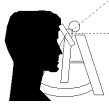
Figure 5 shows a zoom on the pinger's track (red P1), calculated, and the green GPS position of the towing boat (grey DU). This shows that the pinger track is as stable as GPS track, whereas the pinger's track is not filtered.



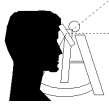
**Figure 6: Acoustic emitter's depth as a function of time**

The figure above shows the depth of the acoustic emitter during the entire track.

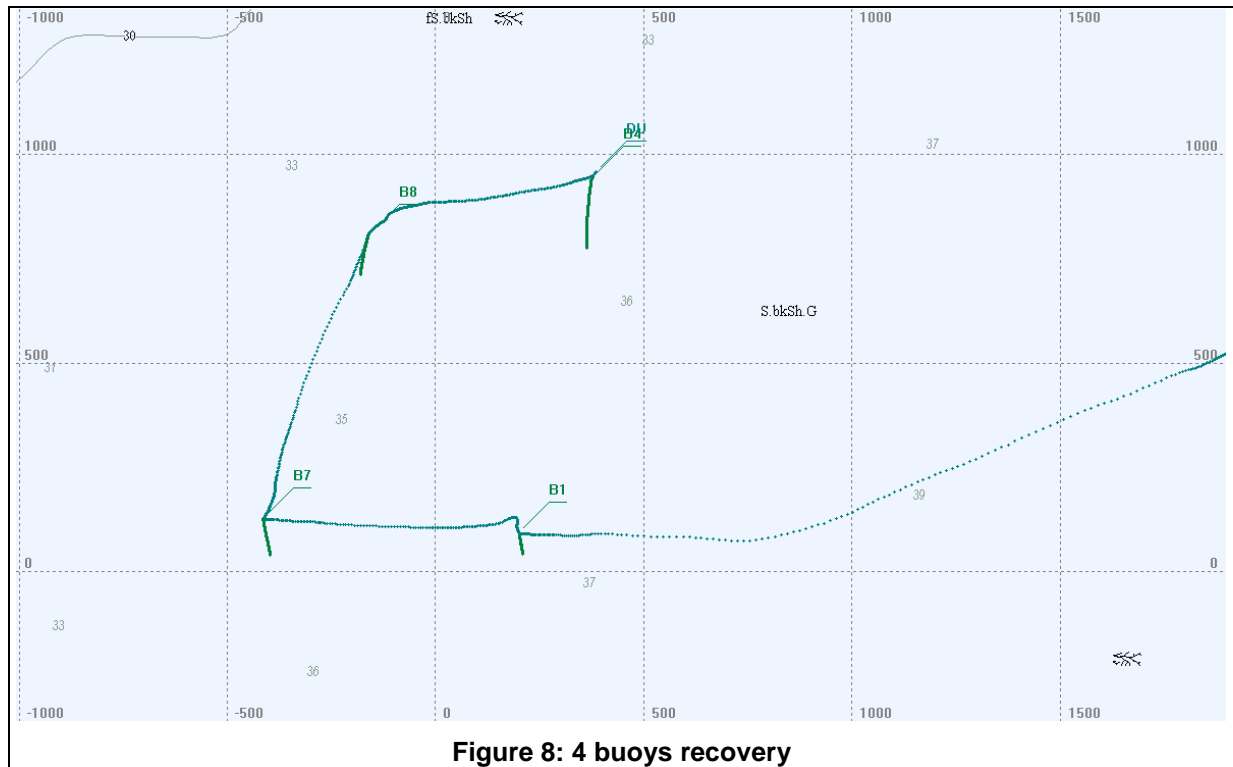
The acoustic emitter used is equipped with a 300 bars pressure sensor (3000 m depth pinger), so small variations in shallow water are not visible.



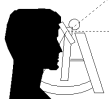
The figure above shows the residual error distribution of the calculated positions into the network of buoys. This residual error reflects the positioning accuracy.



### 5.3 Buoys recovery



The total recovery time is 16 minutes.



## **6. Conclusions**

The demonstration has proven the very high accuracy of the GIB system used in shallow water.

The major advantages of the GIB system are:

- Fast installation on board non dedicated ships,
- Easy to deploy & recover, no calibration,
- Real-time multi-mobiles capabilities,
- Metric accuracy in 3D and accurate positions time stamping,
- High repetition rate,
- Fully operator's configurable functions,
- Real-time Quality Control.