Research Port Rostock

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Topics

- Introduction “Research Port Rostock”
- ALEGRO
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  - GAMMA
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Research Port Rostock

The Research Port Rostock is an initiative of the government of the German federal state Mecklenburg-Vorpommern in cooperation with the regional industry, universities and research establishments.

Objectives:

• Installation of a maritime Test bed for the application and validation of Galileo Core Technologies in the maritime environment of the Research Port Rostock.

• Integration of Galileo Core Technologies into maritime navigation and logistic processes.

• Enhancement of maritime processes for efficient and safe realisation of vessel traffic and cargo handling.

• Demonstration of new products and services under real conditions.
Structure/Projects/Applications

Research Port Rostock

- Infrastructure
- Test Bed
- Demonstration

- Navigation and Docking Maneuvers
- Security and Search & Rescue
- Transport Logistics

- ALEGRO
- SEA GATE
- GAMMA
- ASMS
ALEGRO
Aufbau eines lokalen maritimen Ergänzungssystems zur Unterstützung hochpräziser Galileo-Anwendungen und -Dienste im Forschungshafen Rostock"

Objective: Development of a Maritime GBAS for SoL Applications

Technical Lead: Institute of Communications and Navigation, DLR
Motivation

Positioning and navigation in the maritime context are “Safety of Life” relevant applications of existing and future Global Satellite Navigation Systems to protect the human life and the maritime habitat.

Requirements regarding accuracy and integrity are specified by the maritime user community (IMO = International Maritime Organisation).

<table>
<thead>
<tr>
<th></th>
<th>Ocean/Coastal SAR</th>
<th>Automatic Docking</th>
<th>Dredging/Construction</th>
<th>Cargo Handling</th>
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<tbody>
<tr>
<td>Position Error H/V (m)</td>
<td>&lt; 10 / NA</td>
<td>&lt;</td>
<td>&lt; 0.1 / -</td>
<td>&lt; 0.1/0.1</td>
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<tr>
<td>Alarm Limit (m)</td>
<td>25</td>
<td>0.25</td>
<td>0.25</td>
<td>0.25</td>
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<tr>
<td>Time to Alarm (s)</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>Integrity Risk</td>
<td>1e-5/3h</td>
<td>1e-5/3h</td>
<td>1e-5/3h</td>
<td>1e-5/3h</td>
</tr>
</tbody>
</table>
ALEGRO Schedule

11/2006
- Initial Measurement Activities
  - Validation of GNSS signal quality in the maritime environment
  - Validation of GNSS standard technologies (GNSS alone, GNSS + EGNOS, RTK)

03/2007
- Deployment and measurement of the experimental RTK-System in the Research Port Rostock

06/2007
- Development & integration of „GNSS Performance Assessment Facility“ into ALEGRO GBAS station

12/2007
- Enhancement RTK-Technology
  - Multicarrier-based RTK
  - GNSS quality- & integrity information in real time

01/2008
- Experimental Validation of RTK prototype in different application scenarios; Demonstration

09/2008

Qualification of the RTK technology for maritime “Safety of Life” application
Initial Measurement Activities

The rover equipment was deployed on the research vessel “Prof. A. Penck” of the IOW.

From 30th January up to 2nd February 2007 it cruised in the harbour Rostock and at the Baltic Sea.

In the near environment routinely transport and traffic processes occurred.

The DLR measuring Van was used as a reference station in this initial campaign.
A position accuracy in the dm-level can be achieved ensuring the reception of time synchronised RTK corrections at the user site.

Reliability of RTK based positioning requires integrity monitoring at the user and reference station site (no part of existing standard technologies).
Enhanced RTK-System
(R&D objective of ALEGRO)

Enhancement by:

- Real Time GNSS Assessment Facility
- Adaptive navigation algorithm
- Self-monitoring of RTK system
- Preparing multi-carrier processing (GALILEO feature)
Objective: Development of a Galileo-Test-Infrastructure with Pseudolite-Technologie

Technical Lead: EADS RST (Rostock System-Technik GmbH)
Research Port Rostock Operating Field

- Sea Channel
- Turning base
- Scanline Pier
- Dock Area
SEA GATE
Location of MCS and Pseudolites

- Pseudolites
- Reference Station
SEA GATE Pseudolite Coverage
SEA GATE Schedule

KO: 16.10.2006

22.11.2006: System Requirement Review


28.03.2007: Critical Design Review

12.09.2007: System Acceptance Review

30.01.2008: Test Readiness Review

16.04.2008: System Performance Review

2006 2007 2008
GAMMA
Galileo Augmented Motion in Maritime Application

Objective:
- Setup of maritime Galileo-Testbed

Technical Lead:
- MarineSoft GmbH

GAMMA Subprojects
GNSS-based systems for
- safe manoeuvres/ safe docking of cruisers
- half-automatical rescue of persons
- effective handling of goods in the harbour
Objective:
Enhancement of the degree of automation of vessel traffic management:
• Traffic Situation Awareness
• Prediction
• Shore Based Pilotage

Technical Lead:
Institute for Navigation, Warnemünde

Status:
Kick Off: October 2007
Contacts

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