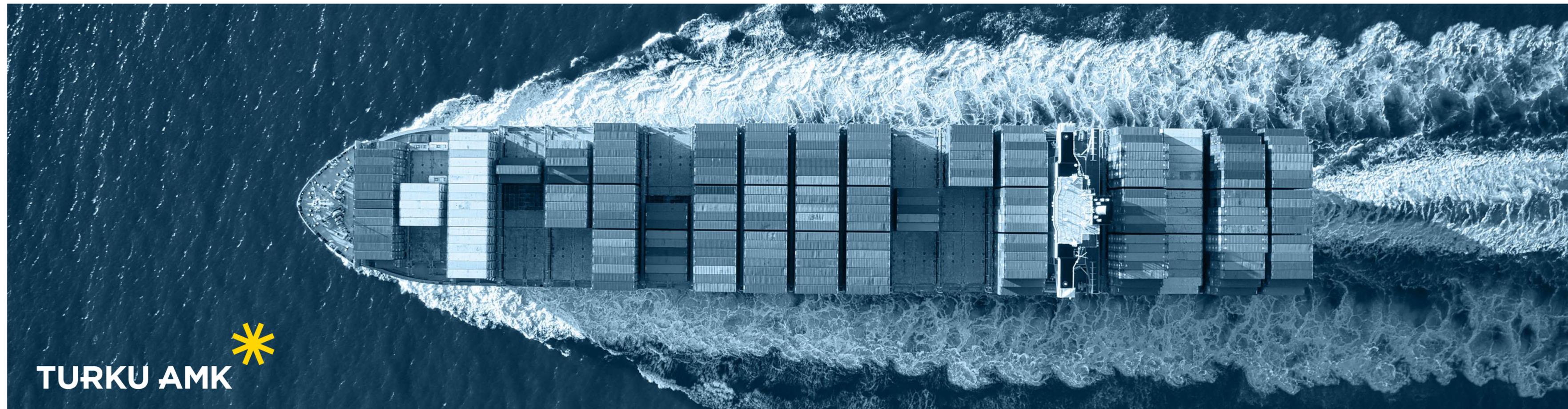


# Seminar on Maritime Wireless Connectivity and Security

12.12.2024



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Regional Council of  
Southwest Finland

# Agenda

## Session 1: Maritime Wireless Connectivity and Turku UAS Test Environments 9.00-11.10

- Tero Jokela, Turku UAS and Andrei Morariu, Åbo Akademi: 5G-ADMO project
- Heidi Himmanen, Traficom: The role of wireless connectivity for digitalisation of maritime operations
- Matko Barisic, ABB: Architecture and modularity enabling a stepping-stones approach to intelligent shipping
- Markus Säynevirta, Airbus Defense and Space: Satellite connectivity for maritime
- Simo-Ville Hönö, Omnitele: Network measurements and future network development
- Kai Jämsä, Tommi Tuomola and Amin Majd, Turku UAS: SafeSea and CSG projects

Lunch and demos until 12.00

## Session 2: Maritime Security 12.00-14.00

- Pia Satopää, Turku UAS, and Olli Soininen, Fintraffic: Handbook for Maritime Cybersecurity
- Barbara Arbanas, University of Zagreb: Autonomous USV-UAV system in GNSS-denied environments for inspection and intervention at sea
- Muhammad Erbas, TalTech: Threat modelling framework on autonomous ships
- Janne Muurinen and Pasi Lahtinen, Patria: Patria's maritime domain systems and a review of Robotic Experimentation, and Prototyping with Maritime Unmanned Systems

Demo session and Coffee 14.00-15.00

Possibility for ICT Showroom visit at 14:30

# Organizing projects

## 5G-Advanced for Digitalization of Maritime Operations (ADMO)

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## Cybersecurity governance of operational technology in sector connected smart energy(CSG)

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## SafeSea Test Platform

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## Development of waterway transport with automation and AI (Robosea)

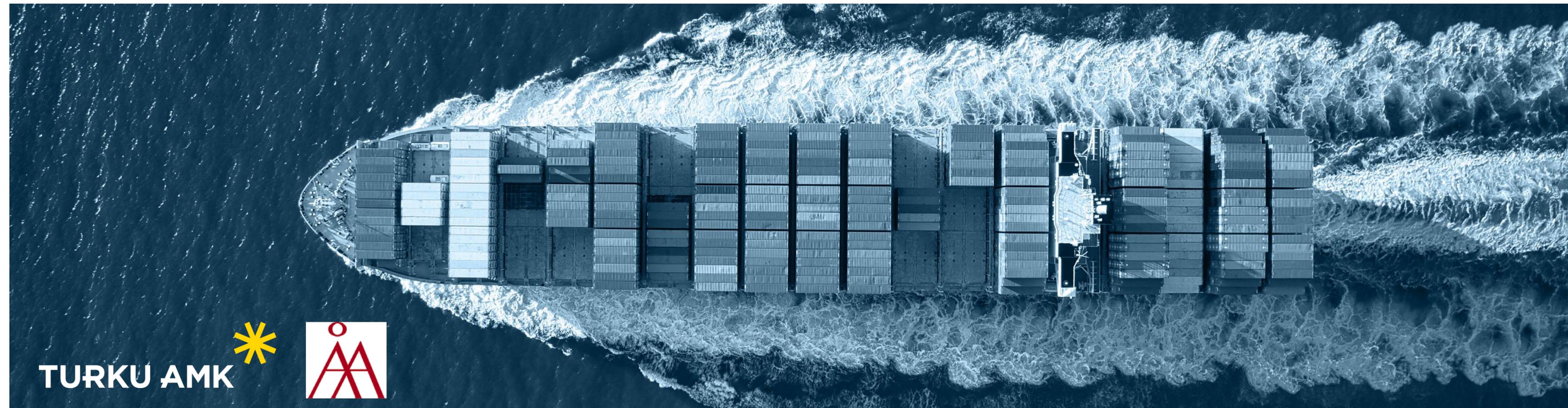
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# 5G-Advanced for Digitalization of Maritime Operations (ADMO)

Tero Jokela (Turku UAS)

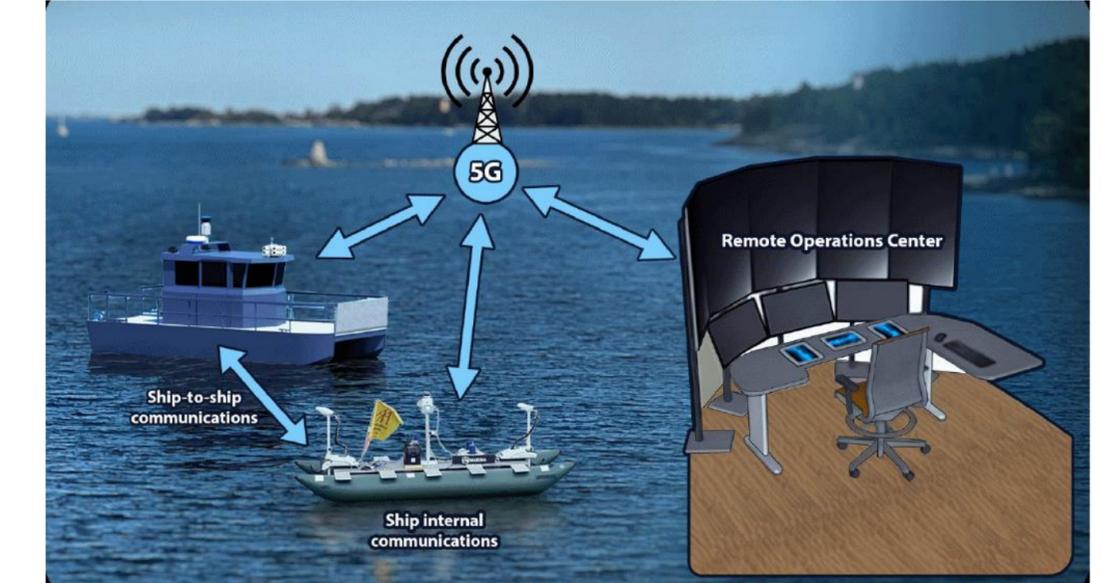


# Project data

- Joint project with Turku UAS & Åbo Akademi
- Funded by Business Finland, Co-research
- Budget 960 k€
- Duration Mar 2023 – Feb 2025
- Advisory board
  - Traficom, ABB, Kongsberg Maritime, Meyer, Fintraffic VTS, Brighthouse Intelligence, Ålcom, Nokia, Finnferries, Awake.AI, Finnlines, ESL Shipping, Raytheon (USA)

# ADMO topics

- Evaluation of current mobile network coverage and quality of service in the maritime environment
  - Maritime connectivity measurements and analysis
- Evaluation of ship internal wireless communication system performance
- Development of a roadmap for deployment of 5G-Advanced as a part of a hybrid connectivity system for the maritime environment
  - Advisory board interviews, one workshop held in spring 2024, work ongoing
- Remote operation of the test vessel using mobile networks
  - Remote operation using 5G networks demonstrated
- international cooperation, benchmarking, exchange of information, and influencing international activities
  - International advisory board, researcher visit to CMMI in Cyprus, International funding proposals

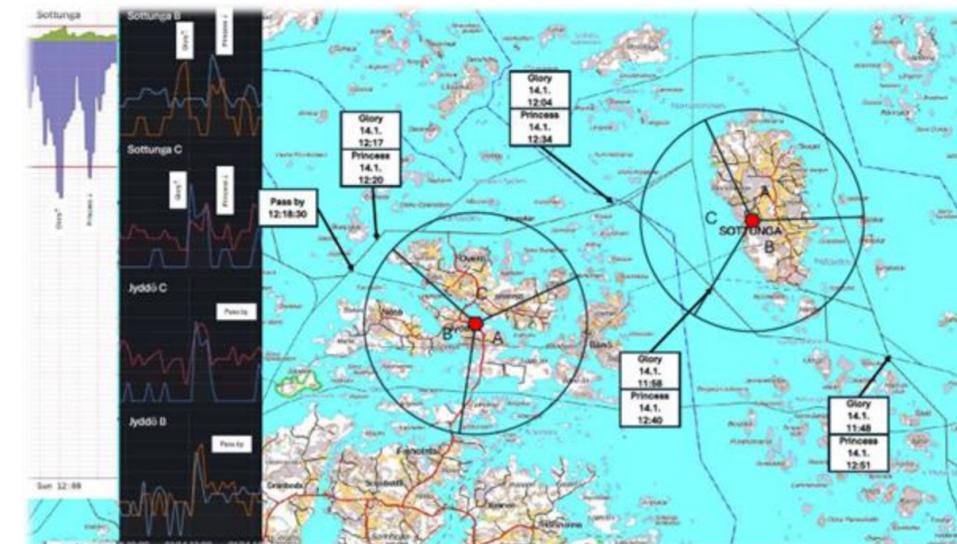
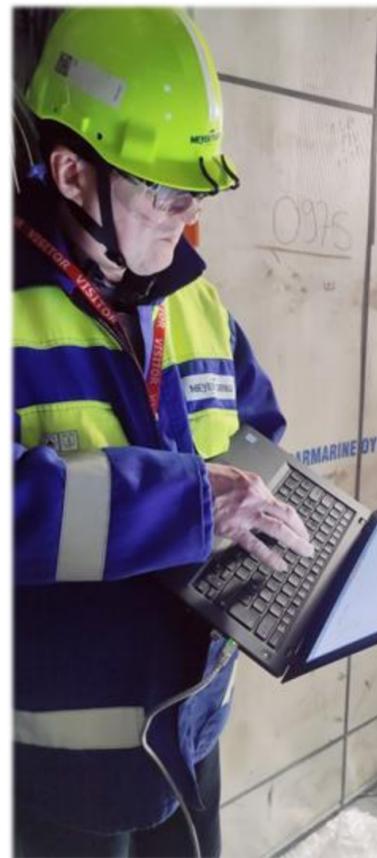


# Main activities (Turku UAS)



Measurements of mobile networks on Finferries ferry route Parainen-Nauvo

Mobile network measurements inside Mein Schiff at Mayer shipyard



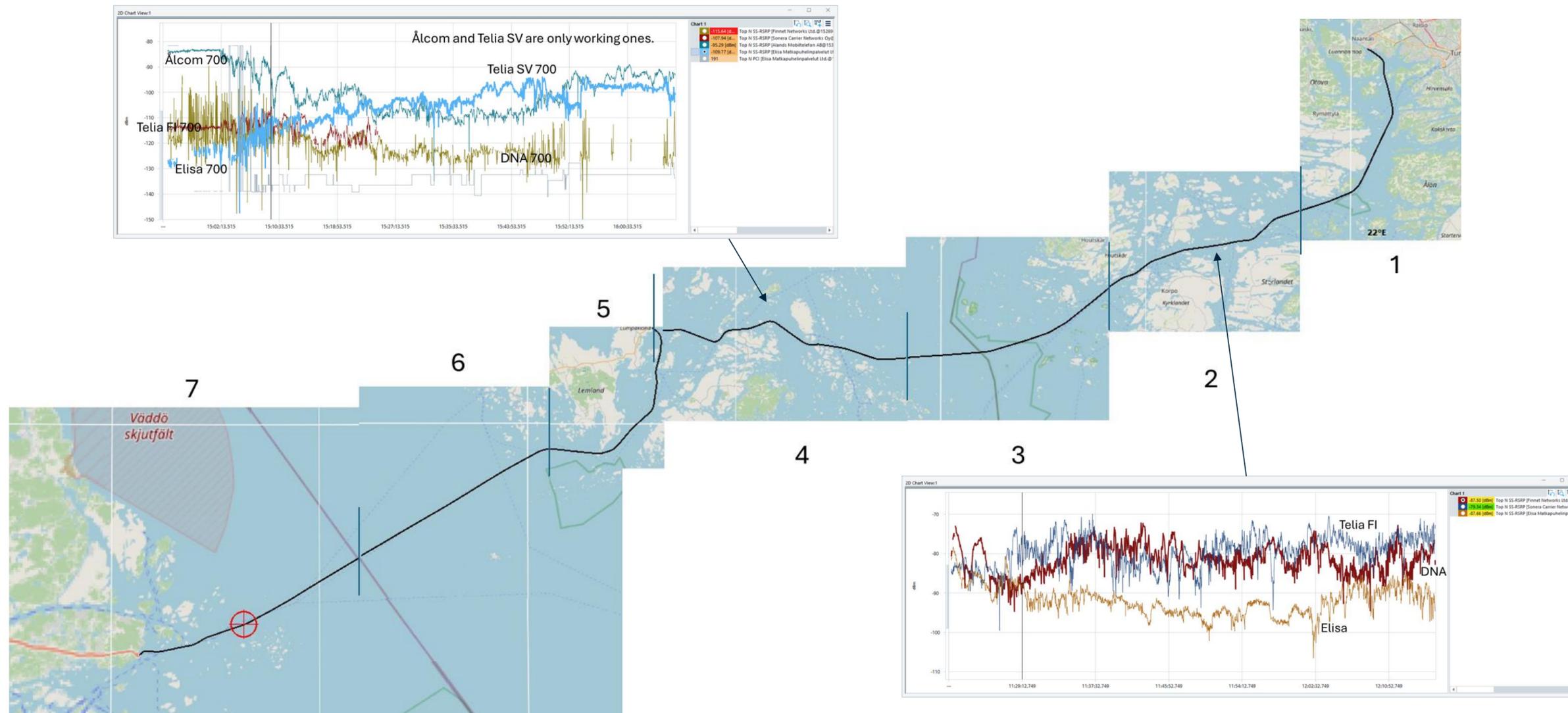
Study on effect of passenger ships on base stations along sea routes with Ålcom

Measurements of mobile networks on Finnlines route Naanatali-Kapellskär



Mobile 5G gNB trials and measurements together with 5G-ROUTES project

# Naantali – Kapellskär measurements



The example signal levels shown for 5G 700 MHz band

Data for all other bands for 4G and 5G for the route are available

A publication with analysis of connectivity is being prepared

**For more information**



Tero Jokela  
Turku University of Applied Sciences  
[tero.jokela@turkuamk.fi](mailto:tero.jokela@turkuamk.fi)

[5g-admo.turkuamk.fi](https://5g-admo.turkuamk.fi)