GM SPAZIO

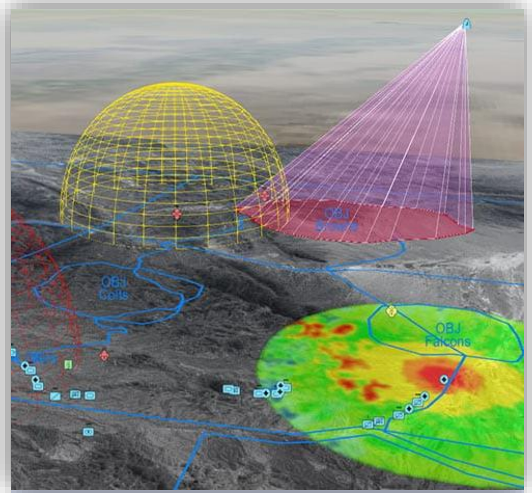
Maritime M&S Capabilities

GMSPAZIO Multidomain Solutions: SEA

Space

Air

Sea



Electromagnetic

GMSPAZIO Maritime and Air Domain Awareness Experience

CWIX 2023 & 2024
Coalition Warrior Interoperability Exercise (NATO)

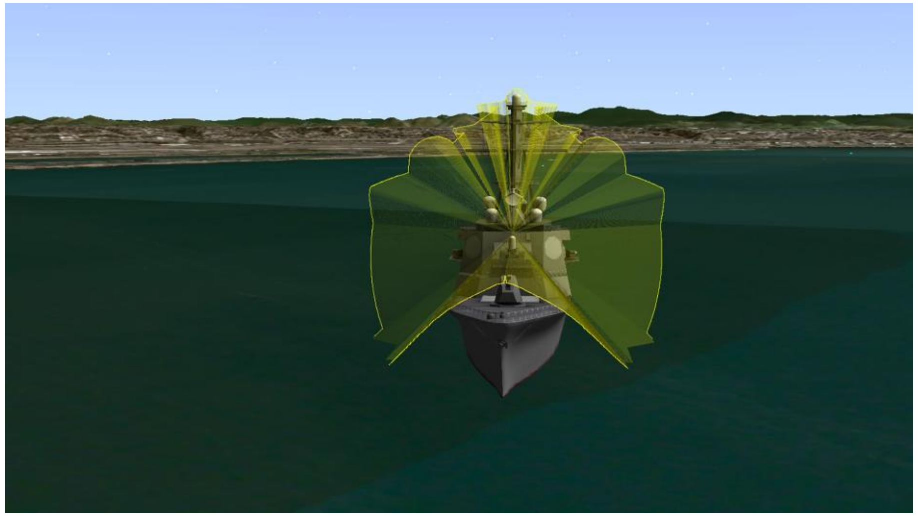
REPMUS 2023
Maritime Exercise (NATO)

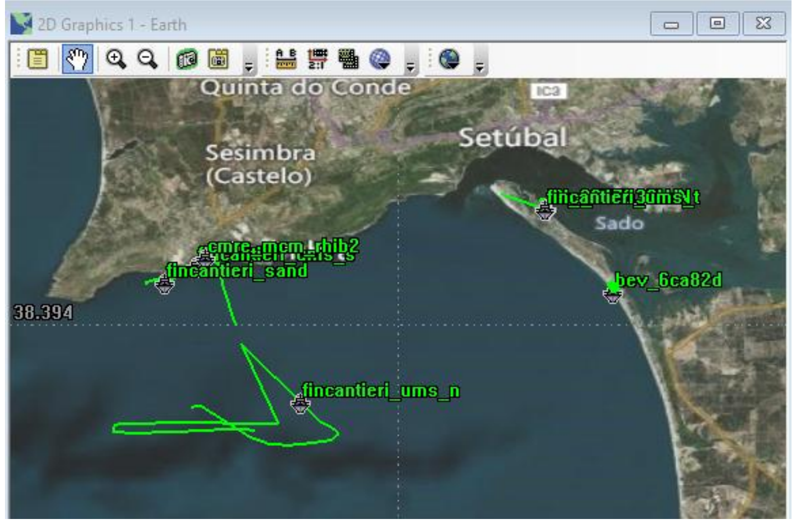
OPEX-TASK 1-2025
Maritime Exercise (Italian Navy)

Maritime domain

Maritime Situational Awareness – MSA

- **Gathering data, parsing, storage and analysis**
  - Post Analysis
  - Near/Real Time Analysis
  - 2D e 3D visualization
- **Comms analysis**
  - Accesses
  - Link budget ecc
  - Underwater acoustic analysis





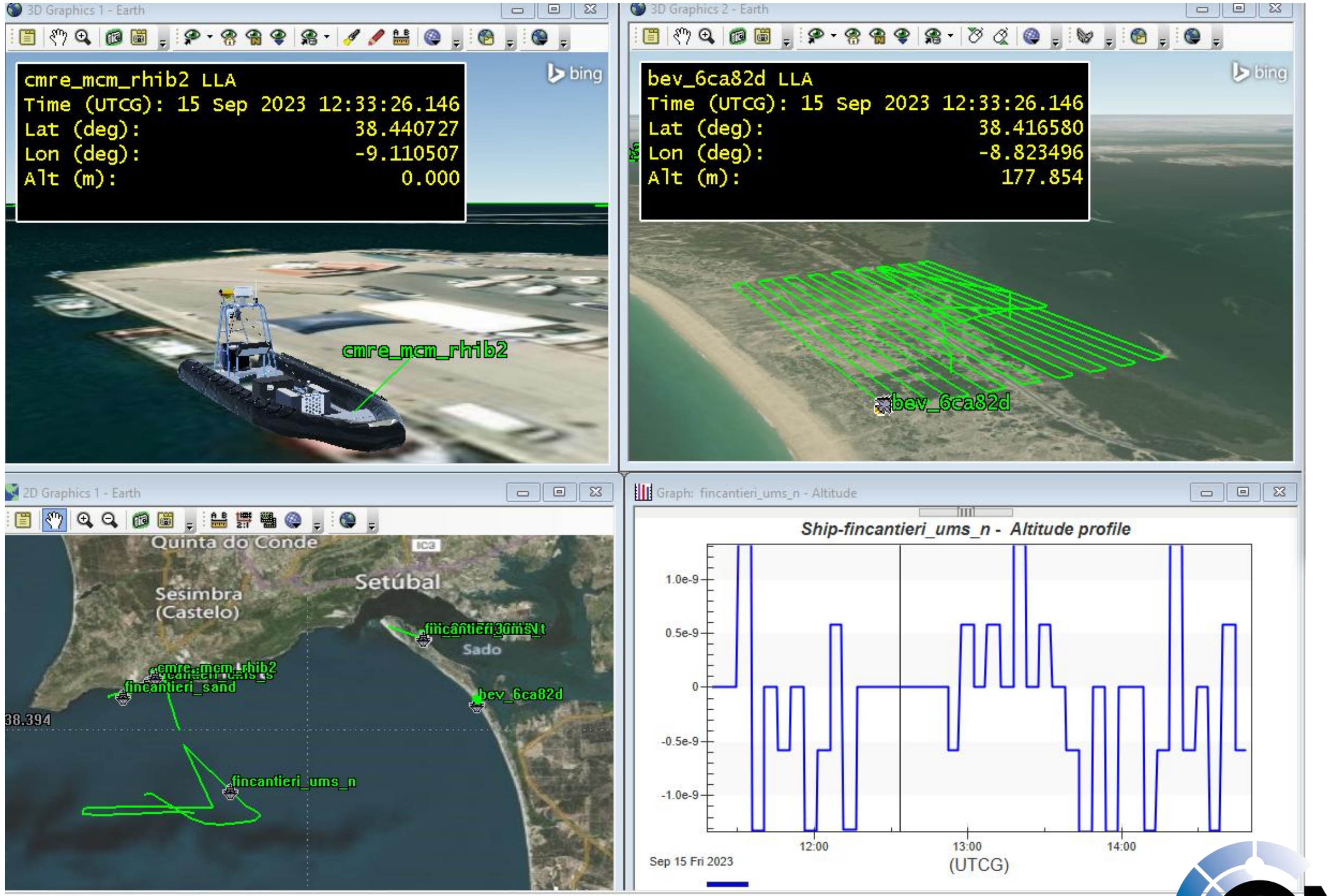
C3MRE Viewer

Solutions for data collection, processing and visualization

C3MRE Viewer

REPMUS 2023 Exercise (NATO)
OPEX TASK 1-25 Exercise (Italian Navy)

- Drone data collection in CATL format
- Database management
- Live & playback visualization



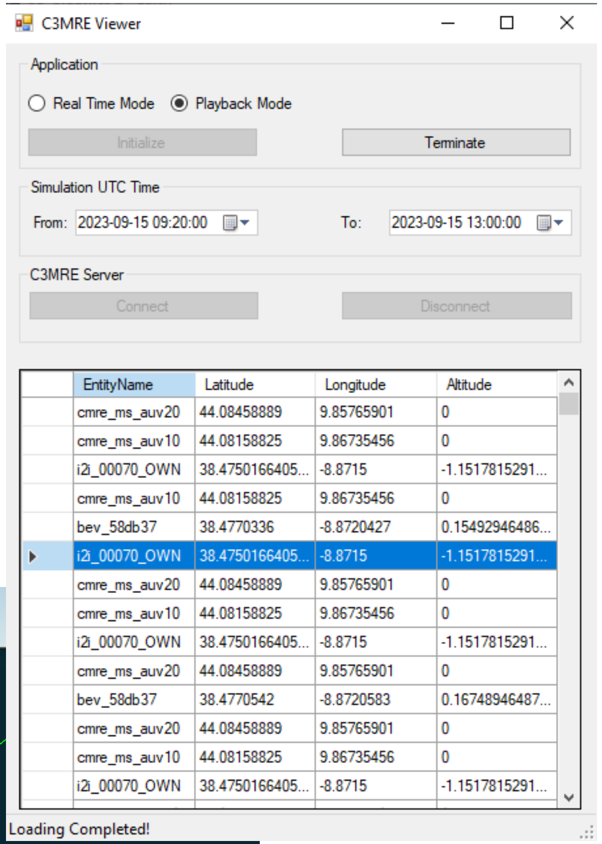
C3MRE: Command, Control, Communication Maritime Robotic Exploitation

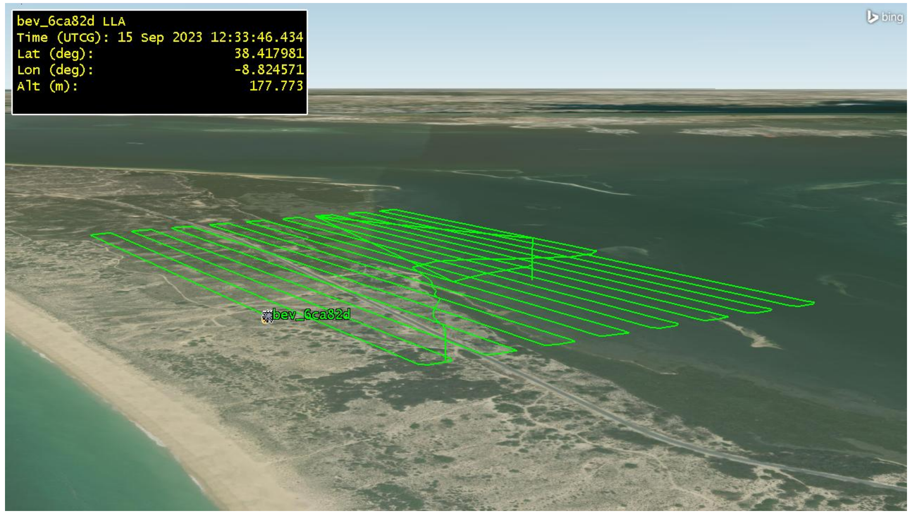
C3MRE Viewer

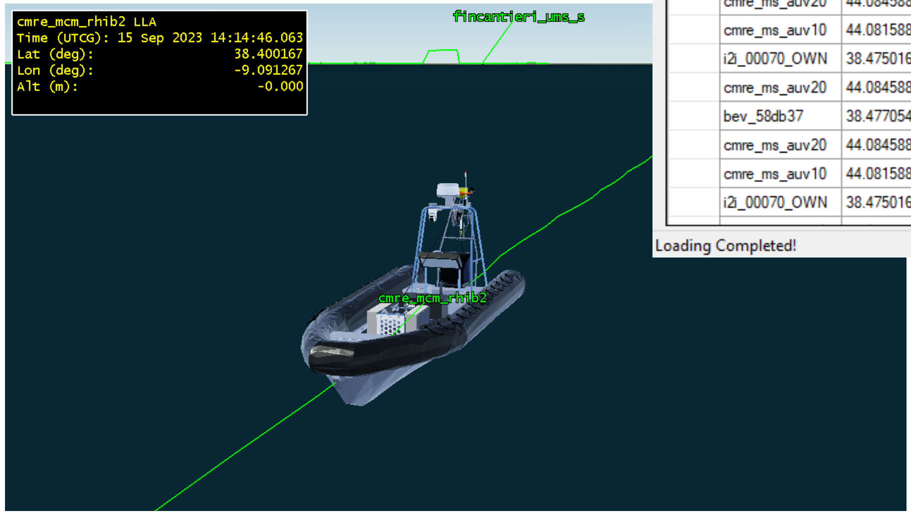
C3MRE Viewer modes:

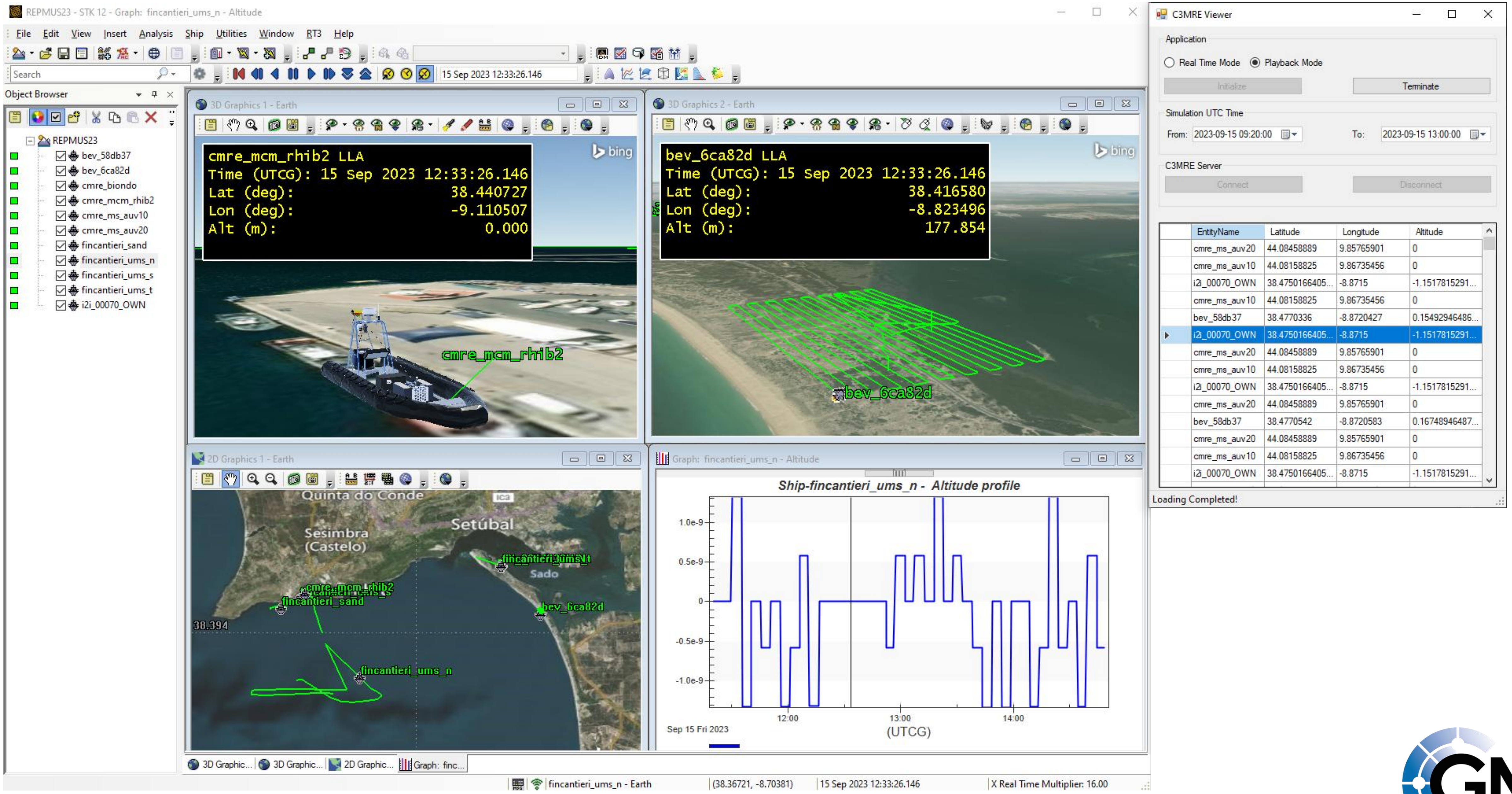
- ***Real Time Mode***: the system remains listening on the topics related to the exercise and sends the extracted data in real time to the viewer.

- ***Playback Mode***: there is also a playback mode where a data set within a defined time interval will be used.








REPMUS23 - STK 12 - Graph: fincantieri_ums_n - Altitude
File Edit View Insert Analysis Ship Utilities Window RT3 Help
15 Sep 2023 12:33:26.146
Object Browser
REPMUS23
bev_58db37
bev_6ca82d
cmre_biondo
cmre_mcm_rhib2
cmre_ms_auv10
cmre_ms_auv20
fincantieri_sand
fincantieri_ums_n
fincantieri_ums_s
fincantieri_ums_t
i2i_00070_OWN
3D Graphics 1 - Earth
cmre_mcm_rhib2 LLA
Time (UTCG): 15 Sep 2023 12:33:26.146
Lat (deg): 38.440727
Lon (deg): -9.110507
Alt (m): 0.000
cmre_mcm_rhib2
3D Graphics 2 - Earth
bev_6ca82d LLA
Time (UTCG): 15 Sep 2023 12:33:26.146
Lat (deg): 38.416580
Lon (deg): -8.823496
Alt (m): 177.854
bev_6ca82d
2D Graphics 1 - Earth
Quinta do Conde
Sesimbra (Castelo)
Setúbal
Sado
38.394
cmre_mcm_rhib2
fincantieri_sand
fincantieri_ums_n
bev_6ca82d
Graph: fincantieri_ums_n - Altitude
Ship-fincantieri_ums_n - Altitude profile
1.0e-9
0.5e-9
0
-0.5e-9
-1.0e-9
12:00
13:00
14:00
Sep 15 Fri 2023
(UTCG)
fincantieri_ums_n - Earth
(38.36721, -8.70381)
15 Sep 2023 12:33:26.146
X Real Time Multiplier: 16.00
C3MRE Viewer
Application
Real Time Mode
Playback Mode
Initialize
Terminate
Simulation UTC Time
From: 2023-09-15 09:20:00
To: 2023-09-15 13:00:00
C3MRE Server
Connect
Disconnect
EntityName Latitude Longitude Altitude
cmre_ms_auv20 44.08458889 9.85765901 0
cmre_ms_auv10 44.08158825 9.86735456 0
i2i_00070_OWN 38.4750166405... -8.8715 -1.1517815291...
cmre_ms_auv10 44.08158825 9.86735456 0
bev_58db37 38.4770336 -8.8720427 0.15492946486...
i2i_00070_OWN 38.4750166405... -8.8715 -1.1517815291...
cmre_ms_auv20 44.08458889 9.85765901 0
cmre_ms_auv10 44.08158825 9.86735456 0
i2i_00070_OWN 38.4750166405... -8.8715 -1.1517815291...
cmre_ms_auv20 44.08458889 9.85765901 0
bev_58db37 38.4770542 -8.8720583 0.16748946487...
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cmre_ms_auv10 44.08158825 9.86735456 0
i2i_00070_OWN 38.4750166405... -8.8715 -1.1517815291...
Loading Completed!

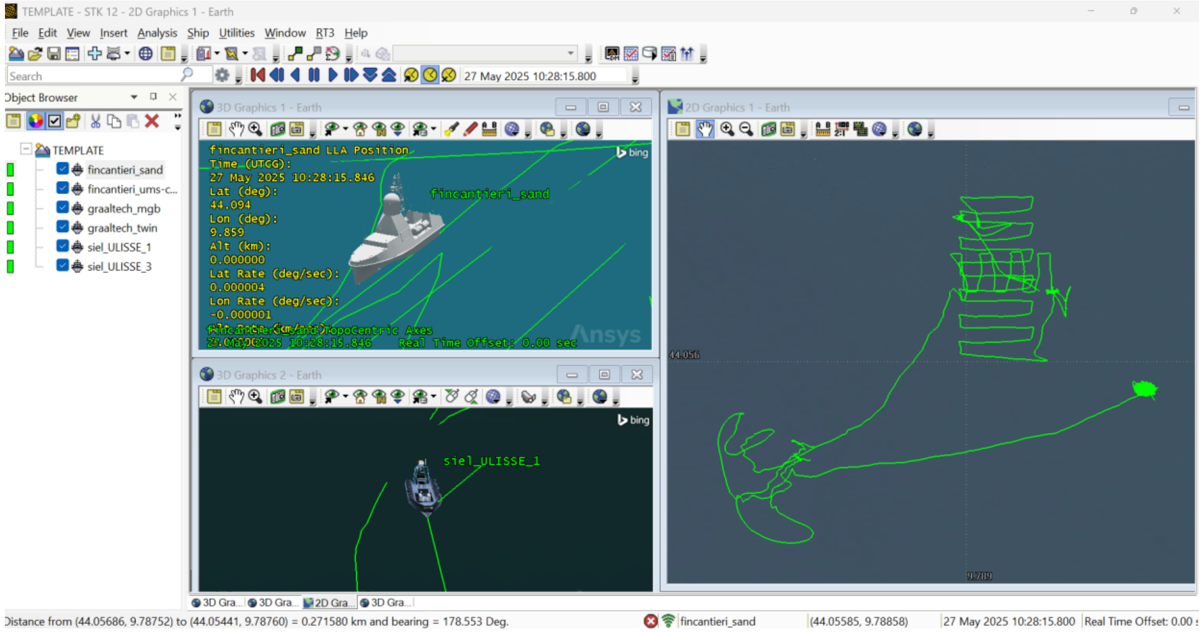
BLUE COMM - Overview

Solution for acoustic communications M&S

Blue Comm

OPEX TASK 1-25 Exercise (Italian Navy)

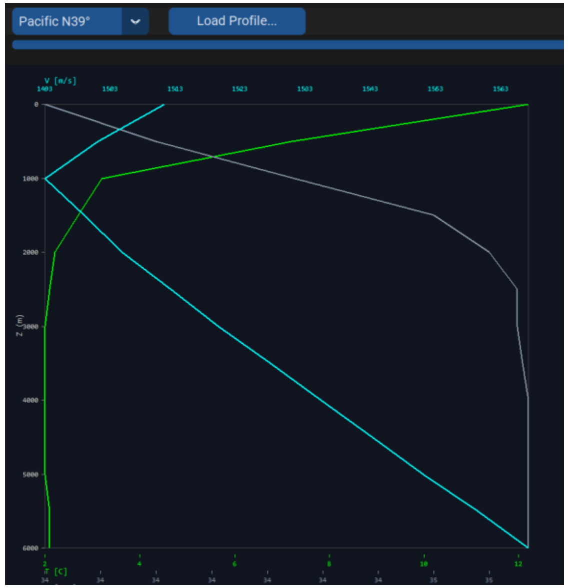
- Acoustic Underwater Communications evaluation
- R-T Technology
- Real world data for vertical modelling



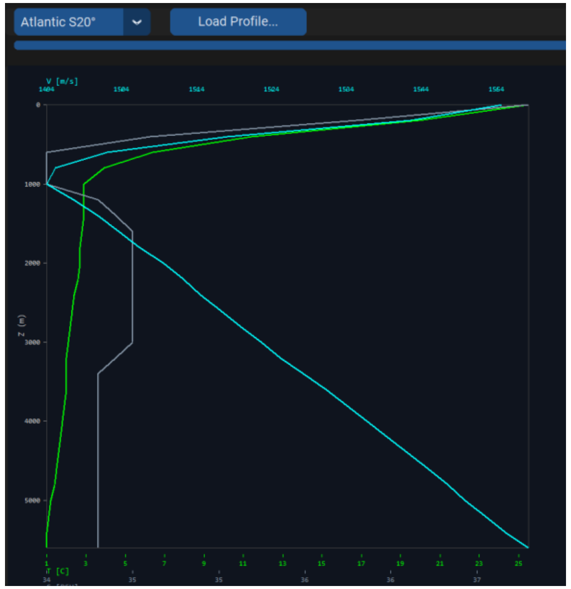
BLUE COMM – Vertical Profiles

Blue: speed of sound
Green: temperature
Gray: salinity

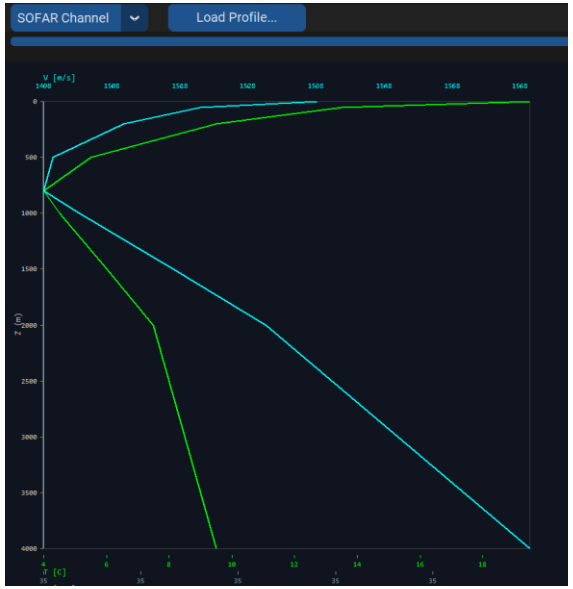
Arctic Profile



Pacific Profile



Atlantic Profile



SOFAR Profile

Custom Profiles can be uploaded for specific analysis

BLUE COMM - Transmitters

Transmitter parameters:

- Takes vessel position from STK Scenario
- Power
- Frequency
- Bandwidth
- Modulation
- Beam angle
- Depth
- Bottom and surface absorption

BLUE COMM - Receivers

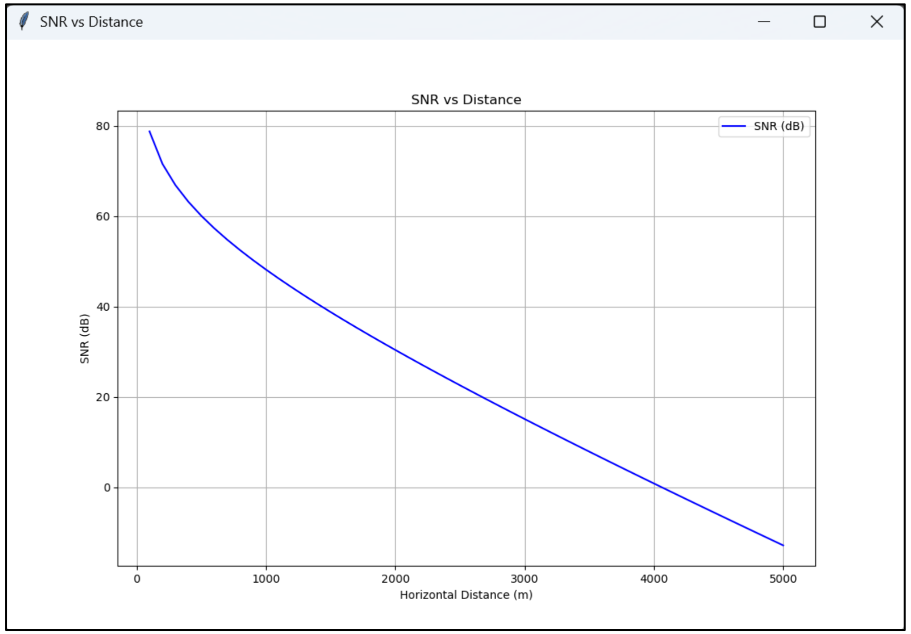
Receiver parameters:

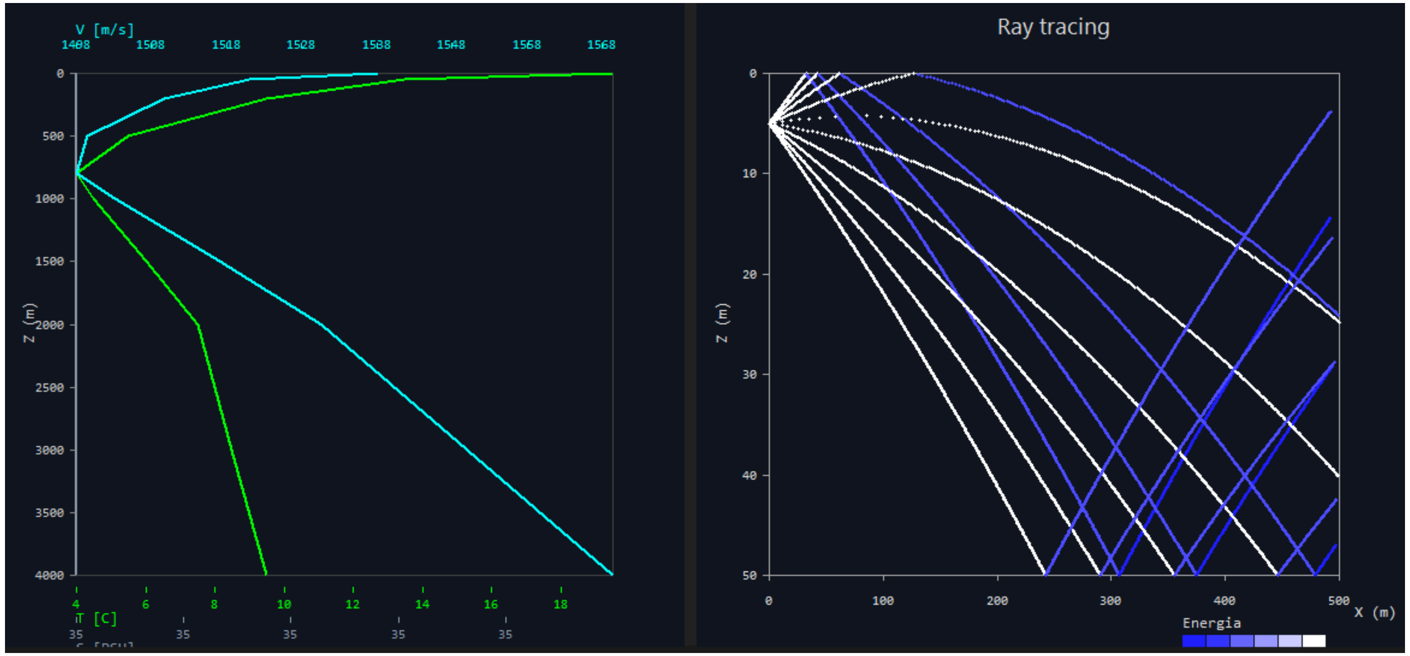
- Vessel position from STK Scenario
- Depth
- Horizontal Distance
- Sensitivity
- Noise Level

BLUE COMM - Output

Outputs:

- Vertical Profile
- Ray paths
- SNR Plot
- Link budget etc.





GM SPAZIO

Thank You