GPS-Tests

- Analyse show a large impact to the GPS-antenna diagram - but
- GPS-tests with a shielded and an unshielded reference antenna were done.
- No degradation of GPS-function was found.
- 4 satellites have to be seen for the correct function of GPS.
- The number of visible satellites is slightly reduced by the cage.

Summary

- Attainable shielding effect approx. 11 dB (factor 3 ... 4) for this cage.
- The cage is cascadeable, two cages deliver about 20 dB. Three cages deliver about 30 dB attenuation.
- The shape of the cage, the diameter of the rods and the dimension of the openings has to be optimised for the susceptible equipment.
- Also applicable for other devices / equipment than GPS-antennas.

Thanks from Nordseewerke to

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  Wehrtechnische Dienststelle WTD 71
  (Bundeswehr technical centre for ships and naval weapons)
  for the attenuation measurement.

NAVAL TOPSIDE EM MODELING AND VALIDATION

Jasper van der Graaff, Frank Leferink
More and more Computational Electromagnetics (CEM) in naval topology design.
We need confidence in simulation tools to replace scale model and full-scale measurements in the optimisation process during the design.
Full-scale verification of the design will remain important.

Scale model testing ('90s)

Simulation and validation
- Accuracy ok.
- Difficulties:
  - definition of the problem
  - importing geometry from CAD files
  - mesh generation.

Simulation tools
- A box with many more or less integrated tools:
  - Completely integrated:
    - DB, DO, DB, full wave (Multi),
    - with interface via DFG, IES, etc.
  - Engineering models in mathematical tools such as MatLab and MathCAD.

Structure of Integrated Toolset
- Database, geometry, DB, DO, DB, database, result & modification.

Singular tools, 1

Singular tools, 2

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- Modern ships: many sensors, high data throughput, hostile environment, limited bandwidth
- One trend: combine all systems in one sensor
- Our approach: Integrated Mini Module (IMM)
- Scalability: necessary for platform application
- Modular: easy exchanging and upgrading during life cycle
- Interfacing: standard interfaces between modules and at interfaces.
- IMM enables use of a mix of new and existing systems.
- Note: all studies are towards integration of functions. This concept is using existing or new systems, but integrates them in a smart way.
- Key element: EM佐藤和人