Challenging wind and waves
Linking hydrodynamic research to the maritime industry

Magnitude of dimensionless vorticity
for an LNG carrier in bow-quartering current

|w| Lpp / Uref

250
225
200
175
150
125
100

- ▲ Experiments
- ● FreSCo computation

Cy

current angle
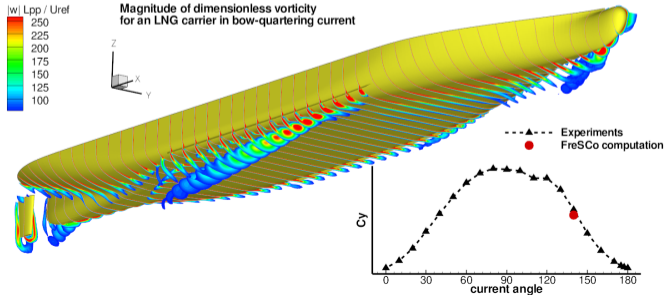
PETSc usage in MARIN's CFD software

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Located in Wageningen, Ede and Houston
Agents in Spain and Brasil
Joint Venture in China
330 employees
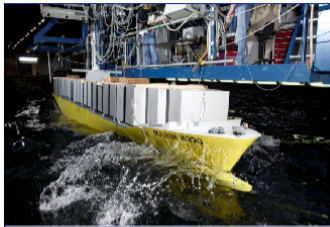Foundation
Non-profit
Since 1932
9200 models
7100 propellers

Simulations

Model testing

Full scale

Training

- Multiphase viscous-flow CFD code, started in 2005
- targeted, verified and validated exclusively for maritime-related applications (ships, offshore, renewables)

- Finite-volume method with cell-centered, co-located variables
- Parallelization based on domain decomposition with MPI
- **using PETSc to solve linear systems in parallel**
  - iterative solvers (GMRES, CG, BiCGStab, ...)
  - preconditioners (Jacobi, ILU, Algebraic Multigrid, ...)