

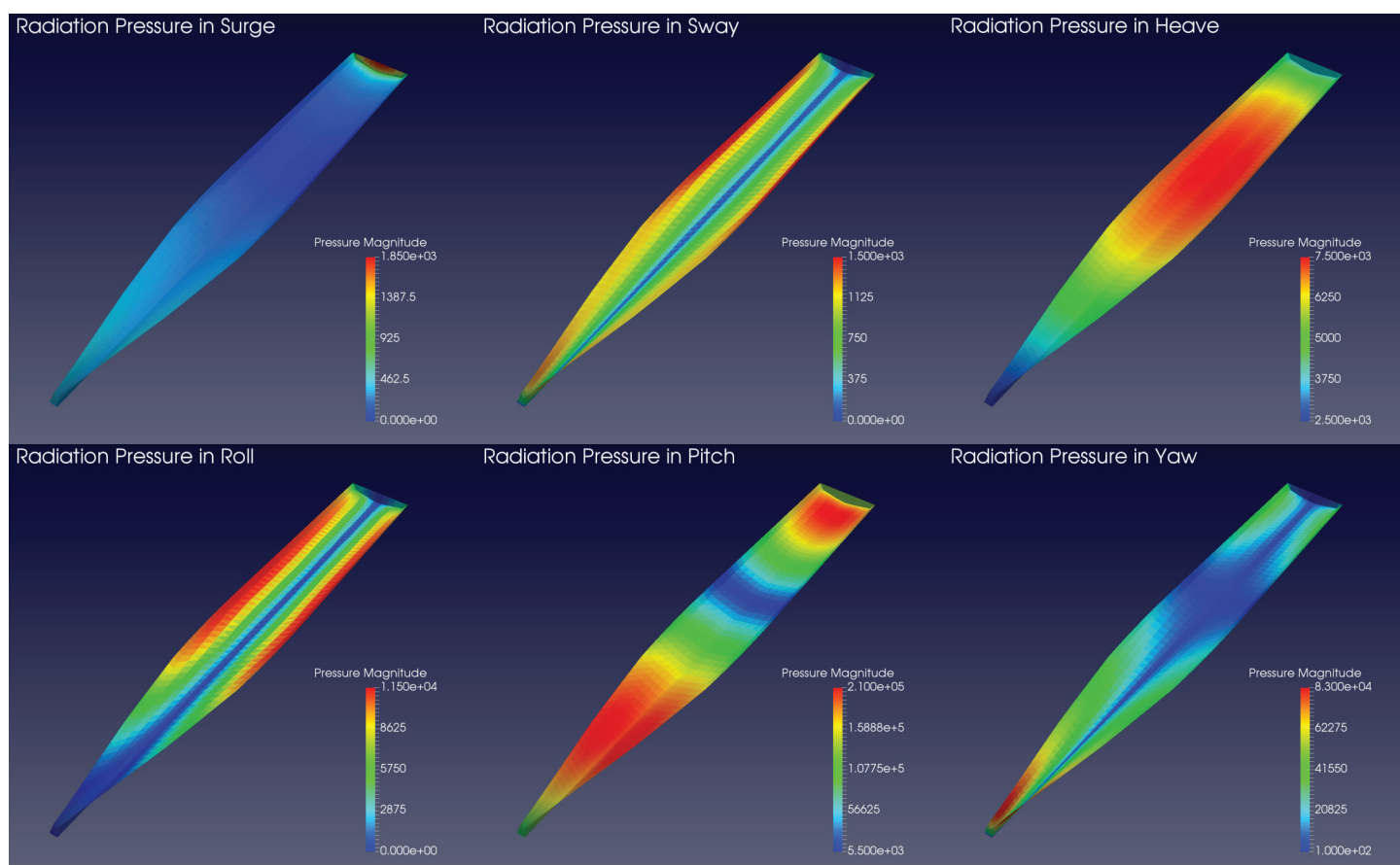
ADRIANA Marine

ADRIANA Marine is designed as a state-of-the-art free surface naval hydrodynamics solver developed in order to support the engineering of naval architecture design projects by reliable numerical calculations of hydrostatic (ADRIANA Stability) and the hydrodynamic (ADRIANA Waves) loads and both rigid & elastic responses of the general marine structures (aquaculture cages, floating breakwaters, pontoons, yachts, ships, semi-submersibles, TLPs, FPSOs, SPARs, FLNGs, FSRUs, FOWTs, WECs).

ADRIANA Marine is a versatile and modular OOP software, thus enabling engineers to streamline their designs, ship owners to reduce the operational costs and maritime authorities to rationally assess the safety margins of marine structures. It can also be readily used as an API in all those applications where an advance hydrodynamics solver is need, as in marine engineering for the functions of advanced on-board loading computer, for the design of active and passive ship motion compensation devices, motion compensated cranes and gangways, towing winches.

ADRIANA Marine can be used for:

- RAOs of ships & offshore structures,
- route and operational profile analysis,
- trim & stability book calculations,
- design of deck machinery and cranes,
- full ship direct strength calculations,
- fatigue assessments of details,
- analysis of aquaculture structures,
- evaluations of WECs,
- design of floating wind turbines,
- offshore heavy lifting analyses.



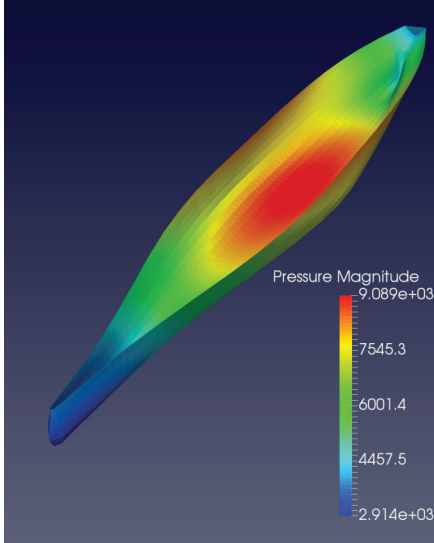
Main features of ADRIANA Waves:

- Free surface potential flow
- 2D direct/mixed BIE (+ strip theory)
- 3D direct/mixed BIE (panel method)
- Arbitrary polygonal meshes
- Infinite and finite water depth
- Irregular frequency removal
- Interface with the FEM software
- Retardation (memory) functions
- Spectral post-processing

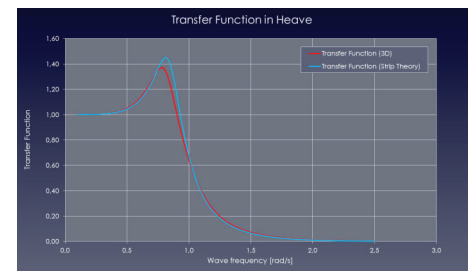
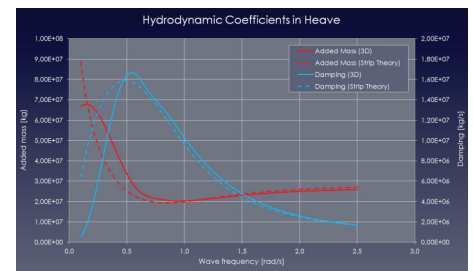
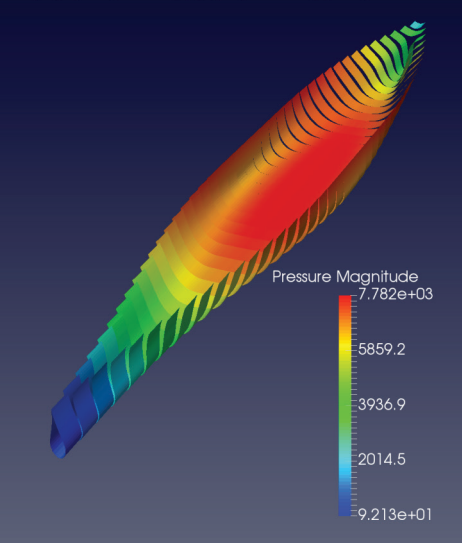
ADRIANA Waves is an advanced and extensively validated 2D and 3D free surface naval hydrodynamics solver based on classical linear free surface potential flow theory and the efficient novel numerical algorithms for the calculation of wave radiation and diffraction of the most general marine structures. It is in fact one of few codes that can calculate on CPUs and GPUs both 2D (strip model is readily available) and 3D hydrodynamics of rigid and elastic bodies (enabling springing and in future whipping analyses).

An important feature of the code is the interface with dedicated FEM structural analysis software, by consistently transferring dynamic pressures from the hydrodynamics mesh to the imported structural mesh, thus enabling the full ship FE model to be totally equilibrated. Additionally, one can transfer the linear hydrodynamics to the time domain using the Cummins approach. Results can be post-processed in terms of both the short-term and long-term responses.

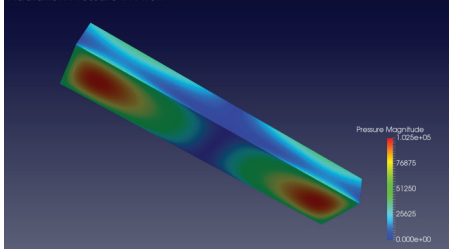
Radiation Pressure in Heave



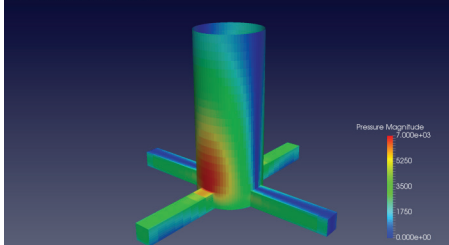
Radiation Pressure in Heave



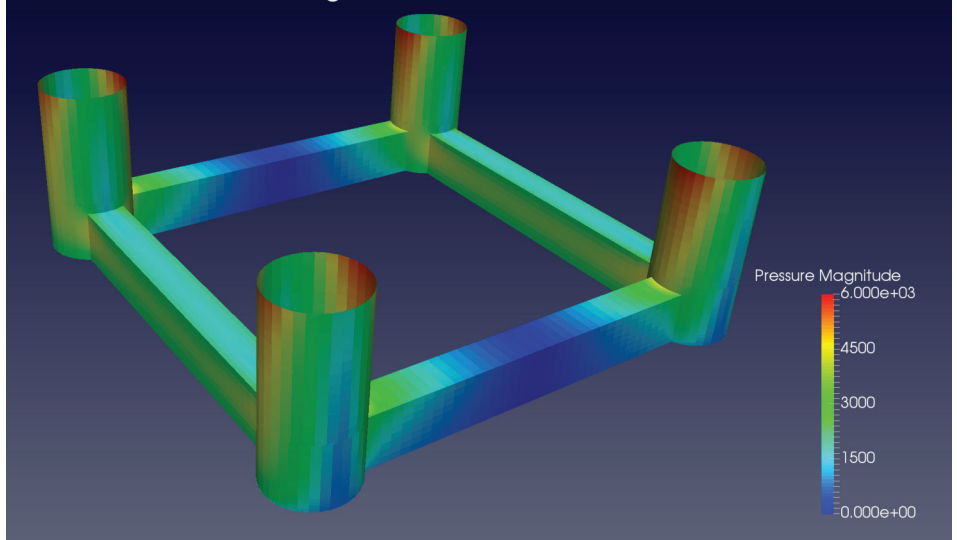
Radiation Pressure in Pitch



Radiation Pressure in Roll



Radiation Pressure in Surge



ADRIANA Marine is in the process of implementing:

- coupled rigid body and linear sloshing analysis,
- modal hydroelastic analysis (springing),
- weakly non-linear FK loading,
- quasi-static mooring analysis,
- fully coupled mooring analysis,
- 2D water entry and exit analysis,
- transient hydroelastic analysis (whipping),
- unified seakeeping and maneuvering simulations.



www.adriana-marine.com
info@adriana-marine.com