



Solutions

Core Competencies

Solutions

3D CAD

- Design of double-curvatures surface
- Specific design tools for any sail-shape
- Fibre layout design
- Rig first concept design
- Flattening 3D surfaces (CAM)

CFD

- Mesh creation
- Modified Vortex Lattice Method
 - Wake relaxation
- 3D panel method
- Viscous solvers for panel methods

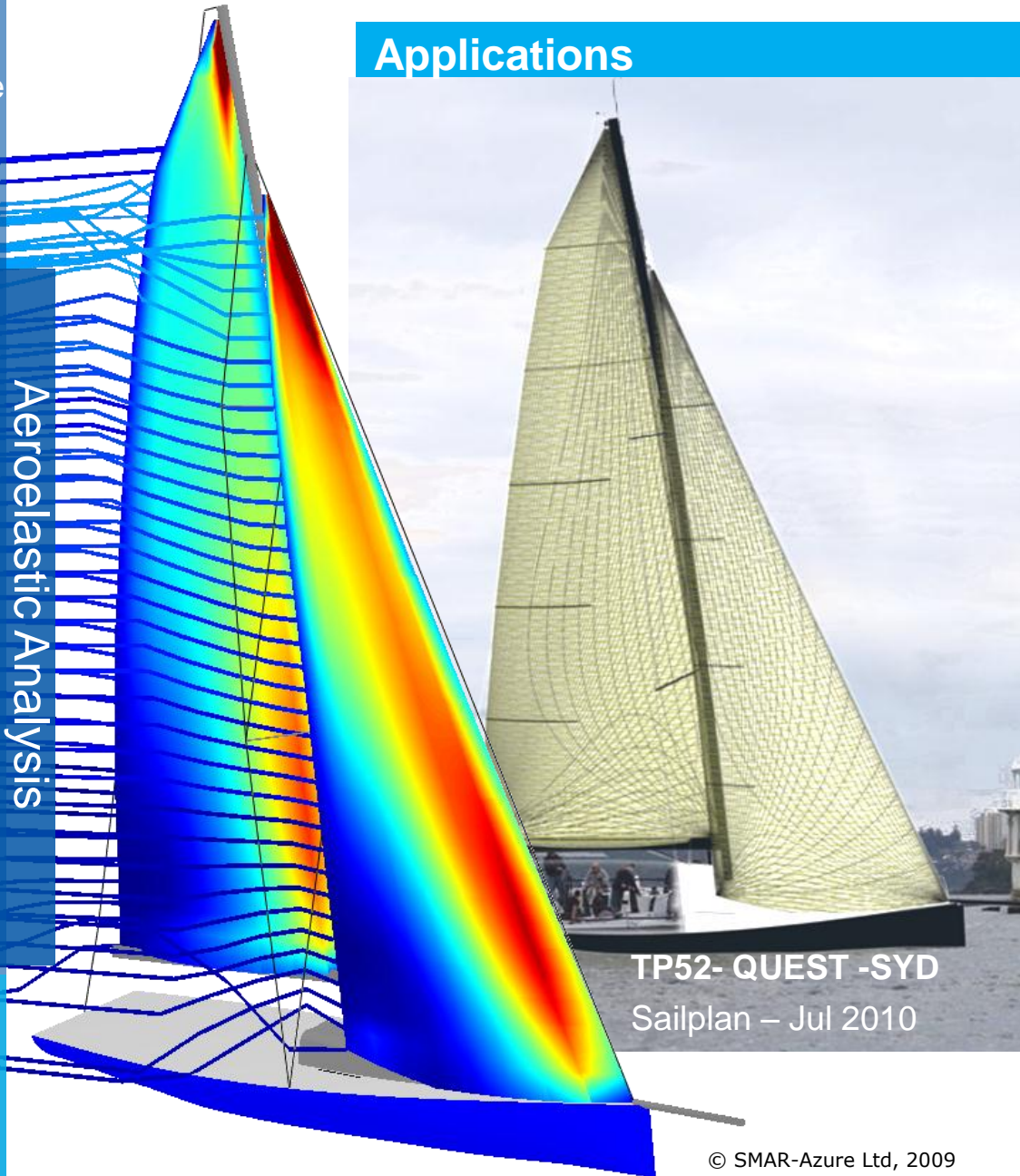
FEM: Non linear FE Analysis

- Automatic Finite Element Model creation
- Automated Aero Forces application
- Membrane, Cable, Beam elements
- 2 solvers
- Isotropic, Orthotropic material
- Composite material
- Composite material properties calculation

DATA MGT/Analysis

- Decoding/converting data of various SW
- Analysis integration system
- Visualization results from different SW

Aeroelastic Analysis



Applications

TP52- QUEST -SYD
Sailplan – Jul 2010

Core Competencies

Software Development

- C++, OpenGL, Visual Studio, Fortran
- Yacht' parts design
- 3-dimensional double curvature surfaces
- Analysis methods for:
 - Aerodynamics
 - Structures
- Interface with manufacturing systems
- Interface with alternative analysis methods
- Interface with other geometry development
- Bespoke solutions

Aeroelastic Analysis

- Potential Flow solutions: VLM and PM
- Viscous solutions
- Non linear FEM/FEA development :
 - Sails (panel / string)
 - Rig
- Optimization of sail-plans:
 - Shape
 - String layout
- Rig-design:
 - Pre-design concept development
 - Sail load calculation

Case studies

Client: Super Yacht

Challenge: Client needed to reduce the weight of the sailplan by maintaining or improving the performances (stability, thrust and shape-holding performance) of the proposed solution.

Solution: Optimization study RESULTS

- **Thrust** **+8.0%**
- **Heeling moment** **- 3.3%**
- **Efficiency:** **+13%**
- **Total weight reduction:** **-9%**
- **Shape holding performance:** **+40%**
- **Maximum stress:** **-7%**

Technologies/Capabilities:

Proprietary sail and fibre layout design and analysis methods



For more information about our optimization service,
please contact **Sabrina Malpede**

E: sabrina@smar-azure.com

T: +44 131 610 7627