

3rd High Performance Yacht Design Conference 2008

(HPYD 3)

**Auckland, New Zealand
1-4 December 2008**

ISBN: 978-1-62276-912-4

Printed from e-media with permission by:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571



Some format issues inherent in the e-media version may also appear in this print version.

Copyright© (2008) by High Performance Yacht Design Conference (HPYD)
All rights reserved.

Printed by Curran Associates, Inc. (2013)

For permission requests, please contact High Performance Yacht Design Conference (HPYD)
at the address below.

High Performance Yacht Design Conference (HPYD)
c/o David Le Pelley
University of Auckland, Mechanical Engineering Department
Private Bag 92019
Auckland, New Zealand

Phone: +64 9 527 5086

info@hpyd.org.nz

Additional copies of this publication are available from:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: 845-758-0400
Fax: 845-758-2634
Email: curran@proceedings.com
Web: www.proceedings.com

3RD HIGH PERFORMANCE YACHT DESIGN CONFERENCE 2008
Table of Contents

KEYNOTE ADDRESS		Page
	Britt Ward, Farr Yacht Design <i>New Directions in High Performance Yacht Design</i>	1
SESSION 1: STRUCTURES		
1.	James Anderson & Sian Raynor <i>Composite Optimisation – A Minefield of Opportunities</i>	10
2.	Rozetta Payne & Nicolas Siohan <i>Comfortable Structure</i>	20
3.	Rebecca Islin, Mark Battley & Susan Lake <i>Low cycle fatigue of composite sandwich foam cores</i>	28
4.	Mark Battley, Jason Schierlink, Tom Allen & Susan Lake <i>Hydroelastic Behaviour of Slam Loaded Composite Hull Panels</i>	37
SESSION 2: AERODYNAMICS - I		
5.	Sabrina Malpede & Alessandro Baraldi <i>A fully integrated method for optimising fibre-membrane sails</i>	47
6.	David Le Pelley & Owen Modral <i>V-SPARS: A combined sail and rig shape recognition system using imaging techniques</i>	57
SESSION 3: YACHT DESIGN PROCESS		
7.	Matteo Ledri, Mauro Poian, Rosario Russo & Enrico Nobile <i>A Web Service for Yacht Designers</i>	67
8.	Kevin Cudby <i>K-Spline: a new curve for advanced hull modelling</i>	74
9.	Vicente Diaz Casás, Fernando Lopez Peña & Richard J. Duro <i>Exploring Automatic Evolutionary Yacht Sail Design</i>	82
SESSION 4: AERODYNAMICS – II		
10.	Fabio Fossati, Sara Muggiasca & Ignazio Viola, Fabrizio Martina, Alessandro Nazareth & Andrea Vallicelli <i>Wind Tunnel and CFD Investigation of Unconventional Rigs</i>	91
11.	Peter Richards, Timm Junge, Heikki Hansen, David Le Pelley & Frederik Gerhardt <i>Optimisation of spanwise lift distributions for upwind sails</i>	101
12.	Thomas Spenkuch, Stephen Turnock, Matteo Scarponi & Ajit Shenoj <i>Lifting line method of modelling covering and blanketing effects for yacht fleet race simulation</i>	111
SESSION 5: HYDRODYNAMICS – I		
13.	Jonathan Binns, Paul Brandner & Julien Plouhinec <i>The effect of heel angle and free-surface proximity on the performance and strut wake of a Moth sailing dinghy rudder T-foil</i>	121
14.	Len Imas, Greg Buley, Bryan Baker & Britt Ward <i>CFD-Based Hydrodynamic Analysis of High Performance Racing Yachts</i>	130

SESSION 6: MOTIONS & PERFORMANCE PREDICTION

15. Yutaka Masuyama & Toichi Fukasawa
Tacking Simulation of Sailing Yachts with New Model of Aerodynamic Force Variation 138
16. Frederik Gerhardt, Richard Flay & Peter Richards
Unsteady Aerodynamic Phenomena Associated With Sailing Upwind In Waves 148
17. Jonathan Binns, Karsten Hochkirch, Frank DeBord & Ian Burns
The development and use of sailing simulation for IACC starting manoeuvre training 158

SESSION 7: CFD

18. Len Imas & JB Braun
High Fidelity CFD Simulations in Racing Yacht Aerodynamic Analysis 168
19. Stuart Norris & Peter Richards
Close coupling of a CFD sail model with a VPP 176
20. Nick Hutchins
The use of ANSYS CFX in America's Cup Yacht design 185

SESSION 8: HYDRODYNAMICS – II

21. William van Rees & Len Imas
A Numerical Investigation Into the Hydrodynamic Performance of a Fin With a Scalloped Leading Edge 193
22. Michal Orych, H Ran & Lars Larsson
Numerical Investigations Of The Effects Of Winglets On IACC Yacht Drag Components 203
23. Yann Roux, Mathieu Durand, Alban Leroyer, Patrick Quetey, Michel Visonneau & Aji Purwanto
Strong Coupled VPP and CFD RANSE Codes on Sailing Yacht Performance Prediction 215

SESSION 8: AERODYNAMICS – III

24. Richard Flay, Stuart Norris, Katherine Halliburton, Daniel Jowett & Natasha Erriu
Performance Prediction Of the Olympic Variant Tornado Class Catamaran 227
25. William Graves, Todd Barbera, JB Braun & Len Imas
Measurement and Simulation of Pressure Distribution on Full Size Sails 239
26. David Le Pelley, Lief Kjelberg & Richard Flay
The effects of staysails on yacht performance 247
27. Julien Pilate, Frederik Gerhardt and Richard Flay
Development of a three-dimensional inverse sail design method 257
-