# International Conference on Wind Propulsion 2021

Online 15-16 September 2021

ISBN: 978-1-7138-8311-1

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<sup>©</sup> (2021) by The Royal Institution of Naval Architects All rights reserved.

Printed with permission by Curran Associates, Inc. (2024)

For permission requests, please contact The Royal Institution of Naval Architects at the address below.

The Royal Institution of Naval Architects 8-9 Northumberland Street London, WC2N 5DA United Kingdom

Phone: 020 7235 4622 Fax: 020 7259 5912

publications@rina.org.uk

#### Additional copies of this publication are available from:

Curran Associates, Inc. 57 Morehouse Lane Red Hook, NY 12571 USA Phone: 845-758-0400 Fax: 845-758-2633 Email: curran@proceedings.com Web: www.proceedings.com

## CONTENTS

<b>TRANSITION WIND TECHNOLOGIES IN SHIPPING TO 2050: FACTORS AND CHALLENGES FOR A SUSTAINABILITY TRANSITION</b> <i>J Köhler and E Dönitz Fraunhofer, ISI, Germany</i> <i>F Schätter, Hochschule Pforzheim, Germany</i>	1
HORSES FOR COURSES: HOW TO SELECT THE "RIGHT" WIND PROPULSION SYSTEM AND HOW TO MAKE THE BUSINESS CASE F C Gerhardt, S Werner, A Hörteborn, O Lundbäck, J Nisbet, T Olsson, SSPA Sweden AB, Sweden	7
<b>ESTIMATING THE COST OF GREENING OF SHORTSEA VESSELS AND THE</b> <b>MARKET POTENTIAL OF GREEN RETROFIT</b> O Schinas, HHX.blue, Germany	17
<b>ACCELERATING THE UPTAKE OF WIND PROPULSION IN SHIPPING</b> Z Rafaelova, L Pomaska, V Kosmas and M Acciaro, Kühne Logistics University, Germany	25
<b>A REVIEW OF WIND-ASSISTED SHIP PROPULSION FOR SUSTAINABLE</b> <b>COMMERCIAL SHIPPING: LATEST DEVELOPMENTS AND FUTURE STAKES</b> <i>L Khan, J J R Macklin, B C D Peck, O Morton, J-B R G Souppez, Aston University, UK</i>	33
<b>PERFORMANCE PREDICTION AND DESIGN OF WIND-ASSISTED PROPULSION</b> <b>SYSTEMS</b> F Thies and J W Ringsberg, Chalmers University of Technology, Sweden	43
A CFD STUDY ON WIND ASSISTED PROPULSION TECHNOLOGY FOR COMMERCIAL SHIPPING W C P Hopes, D R Pearson and J E Buckingham, BMT Defence and Security UK Ltd, UK	49
<b>EXPERIENCES OF ROTOR SAIL INSTALLATIONS ON VARIOUS SHIP TYPES AND</b> <b>THE EMISSION REDUCTION POTENTIAL OF ROTOR SAILS</b> J Kuuskoski, Norsepower Ltd, Finland	57
<b>SPEED TRIAL VERIFICATION FOR A WIND ASSISTED SHIP</b> S Werner, J Nisbet, A Hörteborn, SSPA Sweden AB, Sweden R Nielsen, Scandlines, Denmark	61
<b>DEVELOPMENT OF A 1:30 SCALE SAILING MODEL OF OCEANBIRD</b> A Hillenbrand, U Dhomé, J Kuttenkeuler, KTH Royal Institute of Technology, Sweden M Razola, Wallenius Marine AB, Sweden	73
<b>THE HORNS OF THE TRILEMMA: SEAKEEPING MODEL TESTS FOR A WIND</b> <b>POWERED VESSEL</b> <i>F C Gerhardt, M Kjellberg, I Wigren, S Werner, SSPA Sweden AB, Sweden</i> <i>M Razola, Wallenius Marine, Sweden</i>	85
INTERACTIONS BETWEEN TWO FLETTNER ROTORS USED FOR WIND SHIP ASSISTED PROPULSION	99

B Charrier, BC Consultant, France

# FLETTNER ROTORS PERFORMANCE AND INTERACTION EFFECTS ON THE111MARIN HYBRID TRANSITION COASTER111

M Garenaux and J J A Schot, MARIN, The Netherlands

### **RONDOUT RIVERPORT 2040: A COMPREHENSIVE PLAN FOR A WORKING** 123 WATERFRONT AND THE TRANSPORTATION OF GOODS AND PEOPLE IN A CARBON CONSTRAINED FUTURE

A Willner, The Center for Post Carbon Logistics, USA