Prof. Ulrik Dam Nielsen, Technical University of Denmark

Lecture May 30th, 2019, 10:00AM (TPN-USP Lab., Poli-USP)

Title: Sea state estimation using multiple ships simultaneously as sailing
wave buoys

Abstract: This talk presents initial ideas towards a network-based approach for sea state estimation used for marine operations and other maritime applications. In principle, all available means, ranging from in situ buoys, fleet of ships to remote sensing by satellite and aircraft, could be considered, emphasising that each means and any combinations among may act simultaneously. This study focuses on just one of the means; the use of ships as
sailing wave buoys. The work introduces the wave buoy analogy, i.e. ship-as-a-wave-buoy, and it makes a proposal on how to impose (different) weights to the single ship-specific wave spectrum estimates obtained from multiple ships. The article presents a numerical case study, where multiple ships act simultaneously as wave spectrum-estimators. In the analysis, it is shown that the use of simultaneous data from multiple ships leads to more accurate wave spectrum estimations.

SHORT BIOGRAPHY: Ulrik Dam Nielsen is an associate professor at the Department of Mechanical Engineering, Technical University of Denmark, where he also obtained his PhD in 2005, and where he has had the main part of his professional career. Since 2014 he has been affiliated with the Norwegian University of Science and Technology as an assoc. professor II at the Centre for Autonomous Marine Operations and Systems (NTNU AMOS). Ulrik Dam Nielsen's research is focused on technical marine operations at sea, where the interaction between ocean waves and ships (and other structures) is addressed. Notably, the areas of shipboard sea state estimation and prediction of wave-induced response levels are central topics; with the overall objective to ensure safer and more environmentally friendly marine operations.

RESEARCH AREAS:
- Measurements of wave-induced responses.
- Wave estimation.
- Seakeeping.
- Operability assessment including safety and (fuel) performance evaluation.
- Time series analysis.
- Stochastic processes.

TEACHING:
- Principles of naval architecture
- Ship operations – Seakeeping and operability
- Maritime engineering at sea
- Yacht performance
- Statics of structure