

บทความที่น่าสนใจประจำเดือนกรกฎาคม 2559  
สาขาวิทยาศาสตร์และเทคโนโลยี

1	<b>Title:</b>	<a href="#">Model test investigation of a spar floating wind turbine</a>
	<b>Author:</b>	Fei Duan, Zhiqiang Hu, J.M. Niedzwecki
	<b>Journal:</b>	Marine Structures, Volume 49, September 2016, Pages 76–96
	<b>Abstract:</b>	Several floating wind turbine designs whose hull designs reflect those used in offshore petroleum industry have emerged as leading candidates for the future development of offshore wind farms. This article presents the research findings from a model basin test program that investigated the dynamic response of a 1:50 scale model OC3 spar floating wind turbine concept designed for a water depth of 200 m. In this study the rotor was allowed to rotate freely with the wind speed and this approach eliminated some of the undesirable effects of controlling wind turbine rotational speed that were observed in earlier studies. The quality of the wind field developed by an array of fans was investigated as to its uniformity and turbulence intensity. Additional calibration tests were performed to characterize various components that included establishing the baseline wind turbine tower frequencies, stiffness of the delta type mooring system and free decay response behaviour. The assembled system was then studied under a sequence of wind and irregular wave scenarios to reveal the nature of the coupled response behaviour. The wind loads were found to have an obvious influence on the surge, heave and pitch behaviour of the spar wind turbine system. It was observed from the experimental measurements that bending moment at the top of the support tower is dominated by the 1P oscillation component and somewhat influenced by the incoming wave. Further it was determined that the axial rotor thrust and tower-top shear force have similar dynamic characteristics both dominated by tower's first mode of vibration under wind-only condition while dominated by the incident wave field when experiencing wind-wave loading. The tensions measured in the mooring lines resulting from either wave or wind-wave excitations were influenced by the surge/pitch and heave couplings and the wind loads were found to have a clear influence on the dynamic responses of the mooring system.
	<b>Database:</b>	ScienceDirect

  

2	<b>Title:</b>	<a href="#">3D stress intensity factors for weld toe semi-elliptical surface cracks using XFEM</a>
	<b>Author:</b>	John H.L. Pang, Kin Shun Tsang, Hsin Jen Hoh
	<b>Journal:</b>	Marine Structures, Volume 48, July 2016, Pages 1–14
	<b>Abstract:</b>	Stress intensity factor and weld toe magnification factor solutions have been developed for T-butt joint geometries using the three-dimensional extended finite element method to model a semi-elliptical weld toe crack in a fillet-welded T-butt joint plate. The stress intensity factors of the semi-elliptical surface crack in a plain plate under tension were in good agreement with the reference solution by Newman

	and Raju cited in BS 7910 standard. The effect of the fillet welded T-butt joint over the stress intensity factor solution for a semi-elliptical surface crack in a plain plate are presented as a series of weld-toe magnification factors. The new magnification factor solutions were curve-fitted to upper bound, mean and lower bound solutions for practical use in a fatigue life prediction model. The predictions were verified by comparison to available fatigue life data, as well as the commonly used weight function technique. Fatigue crack growth modelling of weld toe semi-elliptical surface cracks were investigated for initial surface cracks with crack depth to plate thickness ratio ( $a/T$ ) of 0.01 and three different crack aspect ratio ( $a/c$ ) of 0.25, 0.5 and 1.0.
<b>Database:</b>	ScienceDirect

3	<b>Title:</b>	<a href="#">Modified environmental contour method for predicting long-term extreme responses of bottom-fixed offshore wind turbines</a>
	<b>Author:</b>	Qinyuan Li, Zhen Gao, Torgeir Moan
	<b>Journal:</b>	Marine Structures, Volume 48, July 2016, Pages 15–32
	<b>Abstract:</b>	<p>Predicting extreme responses is very important in designing a bottom-fixed offshore wind turbines. The commonly used method that account for the variability of the response and the environmental conditions is the full long-term analysis (FLTA), which is accurate but time consuming. It is a direct integration of all the probability distribution of short-term extremes and the environmental conditions. Since the long-term extreme responses are usually governed by very few important environmental conditions, the long-term analysis can be greatly simplified if such conditions are identified. For offshore structures, one simplified method is the environmental contour method (ECM), which uses the short-term extreme probability distribution of important environmental conditions selected on the contour surface with the relevant return periods. However, because of the inherent difference of offshore wind turbines and ordinary offshore structures, especially their non-monotonic behavior of the responses under wind loads, ECM cannot be directly applied because the environmental condition it selects is not close to the actual most important one.</p> <p>The paper presents a modified environmental contour method (MECM) for bottom-fixed offshore wind turbine applications. It can identify the most important environmental condition that governs the long-term extreme. The method is tested on the NREL 5 MW wind turbine supported by a simplified jacket-type support structure. Compared to the results of FLTA, MECM yields accurate results and is shown to be an efficient and reliable method for the prediction of the extreme responses of bottom-fixed offshore wind turbines.</p>
	<b>Database:</b>	ScienceDirect

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<b>Title:</b>	<a href="#">Vertical plane motion control of an S-SWATH vehicle with flapping foil stabilisers sailing in waves</a>
<b>Author:</b>	Hong Dong Wang, Peng Qian, Xiao Feng Liang, Hong Yi
<b>Journal:</b>	Ocean Engineering, Volume 121, 15 July 2016, Pages 184–195
<b>Abstract:</b>	The sailing performance of an S-type small waterplane area twin hull (S-SWATH) vehicle, which has comparable total resistance at low and high speeds, in waves is investigated. A flapping foil stabiliser is proposed to enhance the seakeeping advantages of the vehicle in rough waves. The unsteady hydrodynamic characteristics of the flapping foil stabiliser are investigated, and its working mechanism is modelled based on the data generated using the computational fluid dynamics method with fixed-grid technology. Compared with a conventional fin, the results show the benefits of the flapping foil with relatively higher lift coefficients and lower drag coefficients. The vertical plane motion control model coupled with the mathematical force model of flapping foils is built. A controller combining the model predictive control scheme with input disturbance measurement is designed to compare the performance of the conventional fins and flapping foils in stabilising the heave–pitch motions of the vehicle. For the simulations, the hydrodynamic coefficients of the vehicle and the wave force–moment on S-SWATH are updated based on Salvesen, Tuck and Faltinsen strip theory, which is equivalent to measuring the approaching wave elevation directly. The flapping foil stabilisers show significant improvements in damping the heave–pitch motions of the vehicle in rough seas.
<b>Database:</b>	ScienceDirect

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<b>Title:</b>	<a href="#">Fuzzy time series forecasting of nonstationary wind and wave data</a>
<b>Author:</b>	Christos Stefanakos
<b>Journal:</b>	Ocean Engineering, Volume 121, 15 July 2016, Pages 1–12
<b>Abstract:</b>	In this paper, the well-known Fuzzy Inference Systems (FIS) in combination with Adaptive Network-based Fuzzy Inference Systems (ANFIS) are coupled for the first time with a nonstationary time series modelling for an improved prediction of wind and wave parameters. The data set used consists of ten-year long three-hourly time series of significant wave height $H_S$ , peak wave period $T_p$ and wind speed $WS$ based on hindcasts of WAVEWATCH III model and GFS analysis winds. The field used covers the area $[30W,40E] \times [50N,78N]$ . The initial time series is first decomposed by means of the aforementioned nonstationary modelling into a seasonal mean value and a residual time series multiplied by a seasonal standard deviation. Then, the FIS/ANFIS models are applied to the stationary part only in order to calculate forecasts of future values. Using the nonstationary modelling, forecasts of the full time series are finally obtained. For comparison purposes, the FIS/ANFIS models are also applied to the initial nonstationary series. The performance of both forecasting procedures is assessed by means of well-known error measures. The methodology is applied to obtain (a) point-wise forecasts for a specific datapoint and (b) field-wise forecasts for the whole field of wave parameters. Especially, the latter is

	performed for the first time. The comparison of the error measures from the two approaches showed that the forecasts based on the proposed methodology outperform the ones using only FIS/ANFIS models.
<b>Database:</b>	ScienceDirect

6	<b>Title:</b> <a href="#">A High-accuracy Extraction Algorithm of Planet Centroid Image in Deep-space Autonomous Optical Navigation</a>
	<b>Author:</b> Siliang Du, Mi Wang, Xiao Chen, Shenghui Fang and Hongbo Su
	<b>Journal:</b> Journal of Navigation / Volume 69 / Issue 04 / July 2016, pp 828 - 844
	<b>Abstract:</b> A planet centroid is an important observable object in autonomous optical navigation. A high-accuracy algorithm is presented to extract the planet centroid from its raw image. First, we proposed a planet segmentation algorithm to segment the planet image block to eliminate noise and to reduce the computation load. Second, we developed an effective algorithm based on Prewitt-Zernike moments to detect sub-pixel real edges by determining possible edges with the Prewitt operator, removing pseudo-edges in backlit shady areas, and relocating real edges to a sub-pixel accuracy in the Zernike moments. Third, we proposed an elliptical model to fit sub-pixel edge points. Finally, we verified the performance of this algorithm against real images from the Cassini-Huygens mission and against synthetic simulated images. Simulation results showed that the accuracy of the planet centroid is up to 0.3 pixels and that of the line-of-sight vector is at $2.1 \times 10^{-5}$ rad.
	<b>Database:</b> Cambridge Journals Online

7	<b>Title:</b> <a href="#">Advanced Anti-Spoofing Methods in Tracking Loop</a>
	<b>Author:</b> M. R. Mosavi, Z. Nasrpooya and M. Moazedi
	<b>Journal:</b> Journal of Navigation / Volume 69 / Issue 04 / July 2016, pp 883 - 904
	<b>Abstract:</b> The Global Positioning System (GPS) has become widespread in many civilian applications. GPS signals are vulnerable to interference and even low-power interference can easily spoof GPS receivers. In this paper, two techniques are proposed based on correlators and adaptive filtering to diminish the effect of spoofing on GPS-based positioning. The suggested algorithms are implemented in the tracking loop of the receiver. As a first method, a high-resolution correlator is utilised to avoid big parts of the influence of interference. To improve the results, a multicorrelator technique is also employed. In the second method, an adaptive filter is used for estimating the parameters of authentic plus spoof signals. Interference elimination is performed by subtracting the estimated conflict effects from the measured correlation function. These techniques provide easy-to-implement quality assurance tools for anti-spoofing. As a primary step, in this article, the proposed algorithms have been implemented in a Software Receiver (SR) to prove the concept of idea in multipath-free environments.
	<b>Database:</b> Cambridge Journals Online

8	<b>Title:</b>	<a href="#">AIS Trajectories Simplification and Threshold Determination</a>
	<b>Author:</b>	Shu-kai Zhang, Zheng-jiang Liu, Yao Cai, Zhao-lin Wu and Guo-you Shi
	<b>Journal:</b>	Journal of Navigation / Volume 69 / Issue 04 / July 2016, pp 729 - 744
	<b>Abstract:</b>	Facilitated by recent establishment of terrestrial networks and satellite constellations of Automatic Identification System (AIS) receivers, ship trajectories are becoming increasingly available and the size of recorded trajectories is getting larger. Large sets of trajectories create problems of storing, transmitting and processing data. Using appropriate methods, an accurate representation of the original trajectories can be obtained by compressing redundant information, while maintaining the main characteristic elements. In this paper, a new scheme and the implementation of the Douglas-Peucker (DP) algorithm are presented, which can simplify AIS trajectories by extracting characteristic points. As for the simplification threshold, the solo parameter of the DP algorithm, a new AIS-based minimum ship domain evaluation method is proposed and acts as criteria for simplification threshold determination. Finally, a validation is made to examine the effectiveness of the DP simplification algorithm and the rationality of the simplification threshold. The result indicates that the DP algorithm can simplify AIS trajectories effectively; the simplification threshold is scientific and reasonable.
	<b>Database:</b>	Cambridge Journals Online

9	<b>Title:</b>	<a href="#">Fire safety design of Nile-floating hotels</a>
	<b>Author:</b>	A.M. Salem, E.M. Dabess, A.A. Banawan & H.W. Leheta
	<b>Journal:</b>	Ships and Offshore Structures, Volume 11, Issue 5, 2016
	<b>Abstract:</b>	The importance of Nile-floating hotels as a national income source in Egypt is highlighted in this work. Statistical analysis of collected data of previous accidents that occurred during the past 12 years is presented. The results showed that fire is ranked third among the four common types of recorded accidents. Records also showed that fire is one of the causes of killing or injuring passengers and crew members aboard Nile-floating hotels. An integrated fire and evacuation simulation programme, "FDS+EVAC" is used to analyse the consequences of a worst-case cabin fire scenario that could occur in an accommodation deck aboard a Nile-floating hotel. A series of simulations of the fire scenario under consideration involving an existing design of an accommodation deck as well as seven suggested alternative designs/arrangements of the same deck which are assumed to have equivalent or better level of fire safety have been carried out. The results are then analysed and discussed.
	<b>Database:</b>	Taylor & Francis Journals

10	<b>Title:</b>	<a href="#">Computer programming of free GUIs for the analysis of the behaviour of marine structures</a>
	<b>Author:</b>	José E. Gutiérrez, Blas Zamora, Julio Garcia-Espinosa & María R. Peyrau

<b>Journal:</b>	Ships and Offshore Structures, Volume 11, Issue 5, 2016
<b>Abstract:</b>	<p>This work presents the development of two free graphical user interfaces (GUIs), called FASTLognoter and MorisonForm, both focused on the analysis of the behaviour of offshore structures, especially of offshore wind turbines. The first one is related to the aeroelastic analysis of wind turbines, and the second is concerned with the seakeeping of marine structures. The development of these tools has been carried out using a powerful software called Lognoter. This tool is a free software for knowledge management in technology, which integrates computer programming for allowing the development of GUIs. These GUIs give an open platform for conducting a parametric study of the structural and dynamic behaviour of marine structures. Their coupling permits the user to set a suitable way to evaluate new concepts in marine structures. Finally, an application for the intensive analysis of offshore wind turbines is shown.</p>
<b>Database:</b>	Taylor & Francis Journals