System-Identification for Regular wave

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Abstract [10pt Arial Font, Sentence case, bold]

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In this paper, We study two types of Waves which include linear and non-linear Wave ' identification methods about Nonlinear auto-regressive model(NARM) and Hammerstein-Wiener model. We analyze and optimize parameters in multi-regressions. Under the nonlinear group regression model, we selected three common models, such as wavelet transform, decision tree model, and support vector machine model with Gaussian process. Finally, the Hammerstein-Wiener shows a great performance on identification processes. Specifically, we achieved a maximum accuracy of 88% on our validation set. We used the AIC index and NMSE to measure the superiority of the model, and finally optimized the HW model using Newton's downhill method.

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**Keywords:** *system identification, Nonlinear auto-regressive model, wave predication, Hammerstein-Wiener model, optimization* [10pt Arial font, separated by; semi-colons, first letter of first word of each keyword capitalized, space between the keywords]

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1. INTRODUCTION [10PT ARIAL FONT, UPPERCASE, BOLD]

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Wave forecasting is to predict or report the future wave conditions in advance according to the wind conditions and natural geographical conditions of a certain wind field in the ocean area. Accurately grasping the characteristics of wave models will be beneficial for wave prediction. Jing et al, 2022 proposed a convolution neural-network based regional wave prediction(CNN-RWP) to predict a regional wave under the conditions of wind speed field.

Calculation results of semi-empirical-semi-theoretical formula and numerical simulation are not practical in the ocean engineering

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The Heading 1 should be set in 10pt Arial boldface, bold, uppercase with a leading (interline spacing) of 10pt and a single spacing of respectively, before and after

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   1. **Equations**

Equations should be centered and numbered consecutively, as in Eq. [1]. An alternative method is given in Eq. [2] for long sets of equations where only one referencing equation number is wanted.

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|  |  | [2] |

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* 1. **List**

Lists can be provided using either numbers or bullets:

1. List item 1 like this;
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Tables and figures should appear in one column of a page and be numbered consecutively. Figures and texts may appear on the same page, and a centered caption should appear directly beneath the figure. It is preferable that figures be mounted in portrait style and figure captions are no longer than two lines. On figures showing graphs, both axes must be clearly labeled (including units if applicable).

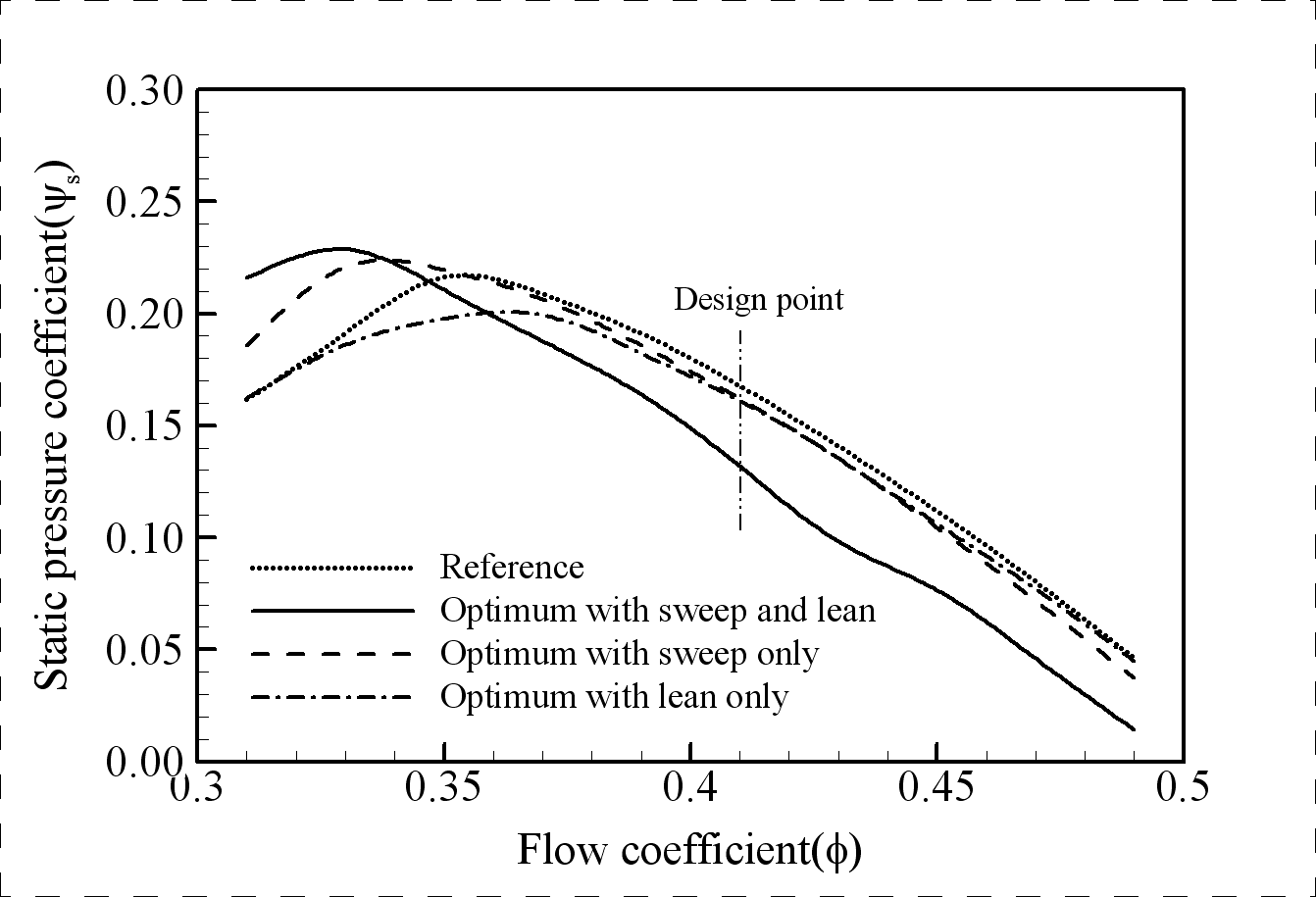
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1. ACKNOWLEDGEMENTS [10pt ARIAL FONT, UPPERCASE, BOLD]

This is where one acknowledges funding bodies, etc.

We appreciate the cooperation and efforts of all authors in producing the Proceedings. This will be a great congress following the tradition of our sponsoring organizations.

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Dong, N.C.(note: no spacing between alphabets), Araki, H., Yamanishi, H., and Koga, K. (2005). Simulation of groundwater flow and environmental effects resulting from pumping. *Environmental Geology,* 47 (3), 361-374.

Donelan, M.A. (1978). Whitecaps and momentum transfer. *NATO Conf. on Turbulent fluxes through the sea surface, wave dynamics, and prediction,* Ed. A. Favre and K. Hasselmann, Plenum, NY, 273-287.

Gran, S. (1992). *A course in ocean engineering*. Elsevier, 583 pp.

Hwang, P.A., Hsu, Y.H.L. and Wu, J. (1990). Air bubbles produced by breaking wind waves: a laboratory study. *J. Phys. Oceanography*, 20, 19-28.

1. b Just like this one.

   \* major words: Nouns, verbs (including linking verbs), adjectives, adverbs, pronouns, and all words of four letters or more are considered major words.minor words: Short (i.e., three letters or fewer) conjunctions, short prepositions, and all articles are considered minor words. [↑](#footnote-ref-2)