



# COLLOQUIUM

Conform artikel 4.6.8 van het SSNS-wb.

Vakgroep: Technische Stromingsleer

In het kader van zijn doctoraalopdracht zal

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een voordracht houden getiteld:

## **Validation study into computation of pressure fluctuations on hull of a ship**

Datum: 27 augustus 2007

Tijd: 14:00

Zaal: HR N109

Samenvatting:

At MARIN, Wageningen, a computational method is developed to compute the pressure fluctuations on the hull of a ship caused by the propeller. These pressure fluctuations excite the hull and can cause discomfort (noise, vibrations) for crew and passengers. A distinction can be made between pressure fluctuations caused by a cavitating propeller and those due to a non-cavitating propeller. The goal of the present study is to obtain experimental data of hull pressure fluctuations caused by a non-cavitating propeller and to use this data-set to validate the computational procedure.

The method of computing the hull pressure fluctuations consists of two programs: the first program calculates the flow around the propeller and the pressure fluctuations as they would exist in the free field without the ship present. The second program calculates the acoustic scattering of the hull. These two results can be combined to obtain a prediction of the pressure fluctuations as they would exist on the hull of the ship.

For the validation, experiments with a ship model equipped with various propellers have been performed for various operating conditions. The propeller of the ship model is driven by an electric motor and the model is towed through a basin. Due to the pressure fluctuations exciting the hull and external influences such as the propeller driving train, the ship model vibrates. These vibrations cause the hull to radiate pressure disturbances which influence the hull pressure measurements. With measurements of the vibrations, this radiated pressure can be calculated and subtracted from the measured pressure to obtain the pressure which can be compared to the computational results.

With the results from the simulations and the corrected results from the experiments, a validation study has been performed. For this validation, two quantities are of importance: the pressure amplitude and also the phase distribution over the hull.

Examencommissie:

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