



COLLOQUIUM

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Vakgroep: **Technische Stromingsleer**

In het kader van zijn doctoraalopdracht zal

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een voordracht houden getiteld:

Modeling Dense-phase Dredging Flows

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Summary:

During the dredging process large quantities of soil-water mixtures are pumped to the surface. To predict the flow in dredge pumps, as a tool in the design process of such pumps, single-phase water simulations are currently used. For low volume concentrations, constitutive relations for the modeling of mixture viscosities exist and are used in methods to simulate dredging flows. However, these relations are not valid for the high volume concentrations normally encountered in dredging flows.

The objective of the present research is to develop a computational method for the prediction of high concentration dredging flows in pumps.

First, preliminary research has been conducted to find appropriate constitutive relations and equations for high concentration two-phase flows. In the literature several models for the description of stresses in two-phase flows are found and an overview of these models is presented. Two of these models are tested in numerical programs and a simulation method was chosen for extensive testing.

This numerical simulation method has been used for predicting the two-phase flow in a dredge pump. The results of these simulations have been obtained for various conditions and have been compared to results reported in the literature from experiments conducted on an actual dredging pump.

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