Opleiding Werktuigbouwkunde

Universiteit Twente
de ondernemende universiteit

COLLOQUIUM

Conform artikel 4.6.8 van het SSNS-wb.

Vakgroep: **Technische Stromingsleer**

In het kader van zijn doctoraalopdracht zal

Kasper Smit

een voordracht houden getiteld:

Model for One-Dimensional Flashing Flow at Choking Conditions in a Venturi

Datum: **13 juli 2007**

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Samenvatting:

In former research a novel concept for degassing crude oil, followed by separating gas and liquid streams, has been developed. Advantages of this degasser are the smaller dimensions compared to conventional gravity degassers and reduced cost of operation. An important aim has been to get insight in the timescale of degassing, which has to be large enough for sufficient degassing and pressure recovery of the process. To estimate the timescale, i.e. the rate of degassing, experiments have been performed. To support these experiments and to scale these results to other cases, a physical-mathematical model implemented in a numerical method is essential.
The main objective of the present study is to develop a numerical method for a flashing flow through a venture, to design and optimize the geometry of this degasser. This method is validated with results from available analytical methods from literature as well as with experimental data from a test facility. The numerical method solves the Euler equations for 1D flow through a tube of varying cross-section, coupled to additional equations representing the behavior of dissolved gasses in the liquid, the conservation of the number of bubbles and mass transfer. The Jameson-Schmidt-Turkel scheme is used for the discretisation. Results for pressure and gas-fraction distributions obtained with the present method show differences with experimental results. It is shown that nucleation is an important source for gas to dissolve in the liquid, and therefore plays an important role in modeling the mass transfer. This research has been carried out in the framework of a project at Shell Global Solutions Amsterdam.

Examencommissie:

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