

ADVANCED COMPUTATIONAL SIMULATIONS OF FLOW AND TRANSPORT PROCESSES IN STIRRED VESSELS

PROJECT AIM

The idea is to reduce the extent of modeling in computational simulation of turbulent flow and transport phenomena in process equipment in general and in stirred vessels in particular. That is part of the reason why we focus on Large-Eddy Simulations (LES). In addition, the inherent transient solutions obtained by means of LES yield a better description of the dynamic environment in which all type of physical operations and chemical processes take place. For reasons of computational efficiency, we prefer Lattice-Boltzmann techniques which allow massive parallelization - at least for the simulation of the flow field.

PROGRESS

As Dr. Derksen left our Department for a position of full professor at the University of Alberta in Edmonton, Canada, this project did not see much progress. After Dr. Gillissen has joined in Summer 2008, further progress is to be expected in 2009. We will explore the options for carrying out Direct Numerical Simulations (DNS) of turbulent stirred vessels.

DISSERTATIONS

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SCIENTIFIC PUBLICATIONS

1. Rohde M, Derksen JJ, Van den Akker HEA, An applicability study of advanced lattice-Boltzmann techniques for moving, no-slip boundaries and local grid refinement, *Computers & Fluids* 37, pp. 1238-1252 (2008).

PROJECT LEADERS

HEA van den Akker, , JJJ Gillissen

RESEARCH THEME

Mathematical and computational methods for fluid flow analysis

PARTICIPANTS

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COOPERATIONS

University of Alberta - Canada (JJ Derksen)

FUNDED

NWO (SARA)

1st 85% 2nd 15% 3rd -

START OF THE PROJECT

ongoing project

INFORMATION

JJJ Gillissen

015 278 9228

www.msp.tudelft.nl