

## STRUCTURED PACKINGS IN THE FISCHER-TROPSCH SYNTHESIS REACTORS: MICRO SCALE APPROACH

### PROJECT AIM

Compared to randomly packed beds, structured, catalytic packings enhance heat and mass transfer. Therefore structured packings have great potential for improving the performance of multi-tubular reactors in the Fischer-Tropsch Synthesis (FTS). Tubular reactors containing structured packings involve phenomena on different scales, from pore diameter to tube length. The complex interplay between these scales is challenging and computational and experimental work is needed to improve packing design. The current project is divided into sub-projects. While our collaborators of DelftChemTech are performing experiments on the collective heat properties of several packing elements, we are using computational tools to study the flow details inside the pores.

### PROGRESS

We implemented a Lattice Boltzmann code for solving 2D, multiphase flows. We tested the model for single and two-phase flow benchmark problems, like Poiseuille flow, capillary rise, and drop formation. These tests have shown that our code has promising potential for investigating multiphase hydrodynamics in structured packings.

### DISSERTATIONS

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### SCIENTIFIC PUBLICATIONS

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### PROJECT LEADERS

HEA van den Akker

### RESEARCH THEME

Complex structures of fluids

### PARTICIPANTS

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### COOPERATIONS

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### FUNDED

STW (GSPT)

1<sup>st</sup> 10% 2<sup>nd</sup> 70% 3<sup>rd</sup> 20%

### START OF THE PROJECT

2008

### INFORMATION

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Structured packing elements, of 10 cm size. Corrugated sheets with alternating orientation create a network consisting of 1 mm pores.