

## WORKGROUP FOR MULTIPHAS FLOWS

### Horizontal channel flow

#### Grant number

-

#### Project title

Transport effects in particle laden, horizontal channel flows

#### Project leader

> (mailto:martin.sommerfeld@ovgu.de) Prof. Dr.-Ing. habil. Martin Sommerfeld

#### Realized by

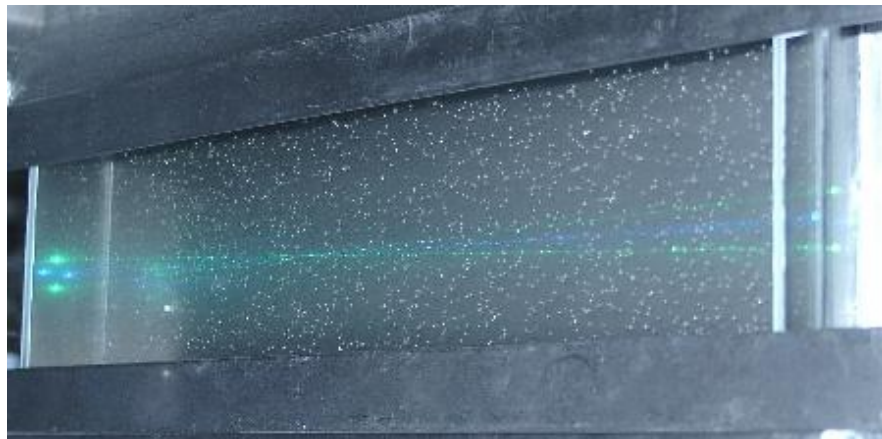
Dipl.-Ing. J. Kussin

#### Keywords

particle laden flow, wall collisions, grid turbulence, phase-Doppler anemometer, mathematical modelling

#### Short description of the project

The project has the goal further to develop and to validate models for the numerical calculation of two-phase flows using an Euler/Lagrange approach to obtain reliable calculations of particle laden gas flows in channels, pipes, cyclones etc. The preliminary investigations showed that the turbulent transport, particle-wall interactions and particle-particle collisions, which have a considerable influence even for small mass loads, are the essential physical effects that determine the particle motion in close turbulent flows.



**Photo:** Measuring equipment

On the other hand, the particles affect the turbulence. Detailed experiments using a relative simple flow configuration of a particle laden, horizontal channel (c.f. Figures) flow have to be carried out to get a better understanding of the several physical effects. In addition to the experimental investigations numerical calculations based on the Euler/Lagrange approach have to be carried out to understand the complex, combined transport effects in this channel flow better. A Reynolds-stress turbulence model, which has to be expanded to two-phase flows, should be used to comprehend the nonisotropic and nonhomogeneous turbulence structure better. Besides, the already implemented models for the consideration of the collisions between the particles and the rough wall and for the simulation of the particle-particle collisions should be validated and improved using the experimental investigations.



Horizontal channel status report

---



Horizontal channel final report

---

