Particle Image Velocimetry (PIV)

The Institute of Multiphase Processes owns a 2D Particle Image Velocimetry system. The optical measurement system allows to measure local velocities. The fluid flow is loaded with tracer particles which have nearly the same density as the fluid for following the fluid without any slip. At two different points of time the laser emits and the measurement volume is illuminated by a light sheet so that two photos are captured. The local velocity vectors \(v = \frac{ds}{dt}\) are calculated by the particle shift \(ds\) and the time interval of the laser shots \(dt\).

**Figure**: Schematical set-up of the 2D PIV system.
The 2D PIV system consists of:

**Laser:**
- Nd:YAG laser
- New Wave Solo PIV II-15
- frame rate: 15 Hz
- energy: 30 mJ at 532 nm

**CCD Camera:**
- Imager QE Imager Intense
- frame rate: 10 Hz
- CCD chip: 1376 x 1040
- CCD pixel: 6.45 µm
- colour depth: 12 bit