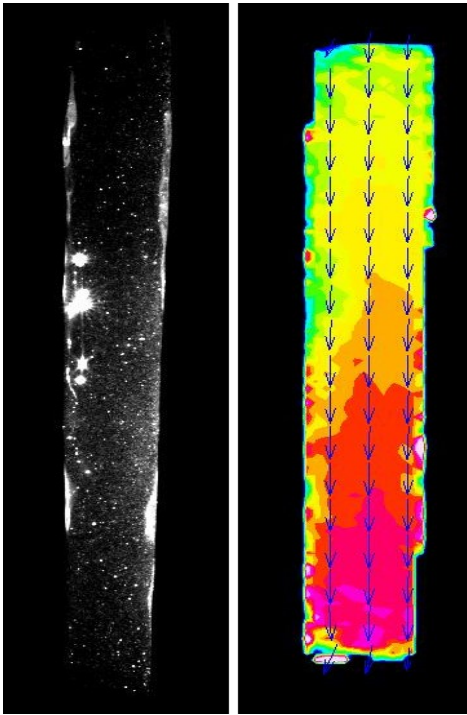


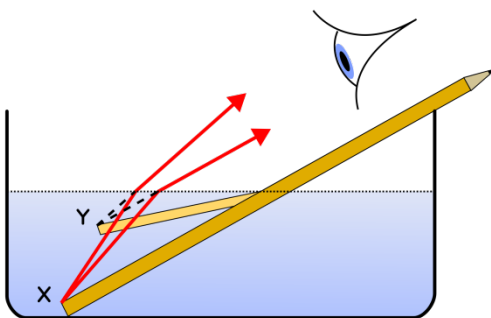
# Subject for a bachelor-/masterthesis:

## Flow visualisation of a two-phase free jet

Courses: Systems Engineering, Produktionstechnik, Physics and related



**Fig. 1:** Visualised water jet and the measured velocity field



**Fig. 2:** A schematic representation of the refraction of light (source: [de.wikipedia.org/wiki/Brechung\\_\(Physik\)](https://de.wikipedia.org/wiki/Brechung_(Physik)))

An established measurement technique for flows is the *Particle Image Velocimetry (PIV)*, where the flow behaviour can be derived from a spatial shift of light scattering particles between two consecutive images (Fig. 1).

An open problem for this measurement technique is the influence of an inhomogeneous refractive index field, e.g. caused by a water jet in air. The light gets disturbed at the surfaces of the fluid jet in such a way that there are shifts in observation caused by refraction (Fig. 2) or even total reflection, leading to the disappearance of the observed object in measurement. Therefore, the influences of the geometry of the fluid jet on the observation have to be characterized in order to enable the flow visualisation of a two-phase free jet.

### Contents:

- Characterising the influence of the jet geometry of the free jet on optical measurement techniques
- Set up a measurement uncertainty budget
- Determine the systematic measurement uncertainties and when possible correct them

### Your profile:

- Interested in optical measurement techniques
- Creative and independent way of working
- Knowledge of programming is advantageous

Kontakt:

**M.Sc. Björn Espenhahn**

☎ (0421) 218 – 646 28

@ bes@bimaq.de

🌐 [www.bimaq.de](http://www.bimaq.de)



(bimaq.de/de/lehre/abschlussarbeiten)