

Technische Universität Dresden | Helmholtzstr. 10, 01069 Dresden

**Student thesis subject:**

## **Experimental analysis of a bubbly water jet**

A multiphase jet is the ejection of a fluid, in which different particles, bubbles and droplets are finely dispersed, from a small orifice. Examples of such systems are the ash clouds of volcanos, the liquid droplets from a spray can or the injection of bubbles in an underwater ramjet engine.

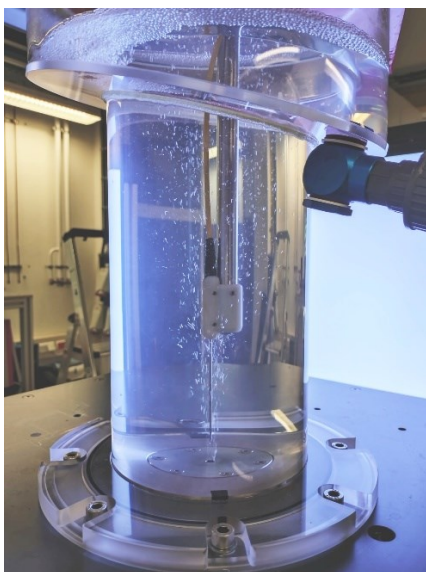
In our numerical and experimental studies of the bubbly jet [1], we encountered an interesting phenomenon that bubbles are pushed out of the jet centre into a thin layer at the jet boundary. This effect may be used to improve mass transfer or bubble-particle collisions in applications such as chemical reactors and mineral flotation. The task of this student work is to perform an experimental parameter study with an optical Doppler probe [2], measuring profiles of the bubble speed, size and volume fraction for different water and air flow rates. The results will elucidate the interaction of liquid flow with bubbles and how the bubble "hole" in the jet centre is affected by the process parameters.

The thesis subject includes...

- conducting and protocolling experiments with advanced optical measurement equipment
- evaluation and interpretation of the measurement data.

[1] Zürner et al., Min. Eng. 211 (2024), DOI: <https://doi.org/10.1016/j.mineng.2024.108699>

[2] Lefebvre et al., Chem. Eng. Sci. 250 (2022), DOI: <https://doi.org/10.1016/j.ces.2021.117359>



**Application and further information at**



<https://www.hzdr.de/db/!ContMan.Angebote.Liste?pSELid=478>

Faculty of Mechanical Science and Engineering  
Inst. of Process Engineering and Environmental Technology  
Prof. Transport Processes at Interfaces

Till Zürner  
+49 351 260 4714  
[t.zuerner@hzdr.de](mailto:t.zuerner@hzdr.de)  
<https://tu-dresden.de/ing/maschinenwesen/ifvu/tpg>

Visitor address, secretariat:  
Merkel-Bau, Room E19  
Helmholtzstr. 14, 01069 Dresden

Postal address (letters):  
TU Dresden, 01062 Dresden

Postal address (packages etc.):  
TU Dresden  
Helmholtzstraße 10, 01069 Dresden