

Characterization of a vortex CO₂ / O₂ aeration set-up

Background

About 80 years ago the Austrian forester and bionics engineer Viktor Schauberger observed that water has the tendency to create natural vortices which, in his opinion, plays an important role concerning water's biological stability. His son Walter followed up on this discovery and defined the geometry of natural vortices as hyperbolic. Using hyperbolically shaped funnels, he (and up to this day many of his followers) claim that processing water through such a funnel would change basic water properties to the better.

Whereas it is rather difficult to define "better" in a physicochemical sense, a hyperbolic vortex does indeed show interesting properties that can influence the water passing through. The most prominent one is probably the fact that it creates a underpressure which pulls in the atmosphere above the vortex, thereby influencing the concentration of dissolved gasses in the liquid. In this project, you will investigate and characterize the capability of a hyperbolic vortex to dissolve CO₂ and O₂ by operating the system at different flow rates, temperatures and vortex regimes. You will document the different regimes using high speed imaging and measure gas concentrations and related parameters (pH, conductivity, etc.) online and chemically. The experiments will be designed using the well-known DOE (Design of Experiments) approach using Mini-tab software. A photograph of the hyperbolic funnel with a water vortex inside is shown below.



Requirements

The ideal candidate has some background in wet chemistry, analytical and physical chemistry. Taking initiative and good communication are important; independency and reliability are required.

Starting date: ASAP

Duration: At least 3 months

Research institute

This project will be carried out at Wetsus, Centre of Excellence for Sustainable Water Technology, located in Leeuwarden, as part of the of the Applied Water Physics research agenda. The institute employs people from very different fields and backgrounds and combines this knowledge for the best results. Wetsus has an international environment where the working language is English, so fluency in this language is required. The researcher will be located at Wetsus.

Application

If you are interested in this project, please contact Dr. Elmar C. Fuchs at Wetsus (elmar.fuchs@wetsus.nl) for more information or directly apply by sending your CV to the same address. The internship/MSc thesis includes a reimbursement for living expenses of 350 euro per month.