

Specialization Project / Master Thesis

Development of a data-driven image analysis method for modeling fouling in a micro-structured heat exchanger



"Canon EOS 600D" by eos600d,
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Whey proteins can form undesirable deposits under thermal stress. This process is known as fouling and consists of deposit interactions and erosion during continuous operation of the technical apparatus. Fouling in micro-structured equipment reduces heat transfer and narrows the cross-section flow area of the microchannel. Finally, the product quality as well as the function of the apparatus is severely impaired. Thus, industrial equipment often is oversized in its design to mitigate the impacts of fouling.

In order to systematically clarify the process of the deposit formation, temperature and pressure curves are recorded in our laboratory test rig and deposits are detected using optical measuring methods.

What you can expect:

- Experimental implementation on the existing test rig and in particular improvement of the image recordings
- Image-optical analysis of the deposits with e.g. "Dynamic mode decomposition" (DMD)
- Modeling of the growth process for different channel configurations
- Parameter studies for different operating conditions

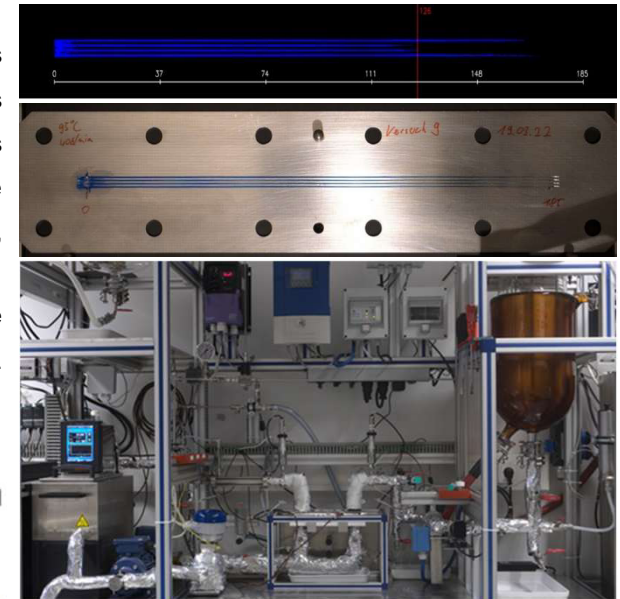
Language: English or German

Software: Python or Julia

Type of Thesis: Experiments, Data Science & Programming

Start: From now on/by arrangement

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Spiegel (2022): Quantifizierung lokaler Foulingphänomene in mikrostrukturierten Wärmeübertragern

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