GLOBAL FLOW MEASUREMENT WORKSHOP
measuring for the energy transition

Poster title:
Automatic Classification of Multiphase Flow from Sensor Data

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Content

In multiphase pipeline flow, the flow regime is generally determined by parameters such as fluid flow rates, pressure, pipe diameter and inclination, in addition to the fluid properties. In a pipe flow laboratory setting, the flow regime has often been identified by means of visual inspection of high-speed optical videos or holdup time histories. This method, however, can be both expensive, inprecise, and strongly influenced by subjective opinion of the person viewing the data.

Over the past two years, the authors have developed a scheme in which Machine Learning methods are applied to X-ray data and gamma densitometer measurements to characterize flow regimes automatically. We are currently studying correlations between X-ray data and other sensor types of data (e.g., pressure) which are more generally available in a field scenario.

The schemes are currently able to distinguish between several types of slug flow, stratified and nonlinear wavy flow. Within certain parameter regimes, a similar method could also be used to predict the flow regime, based on the inlet flow and fluid parameters.