Abstract for DTU Summer School – Pawel Zimoch

Rheology of dense suspensions is still not fully understood, despite their common use in a wide range of products such as inks, paints, foodstuffs and cosmetics. One of the reasons for this is difficulty in visualizing the microstructure and relating it to the bulk behavior of suspensions. We present a new experimental method which enables direct visualization of microstructure by forming of a 2-dimensional flow of a thin suspension layer achieved by isolating it between two layers of oil. We use this strategy to analyze extensional flows of shear thickening suspensions during capillary break-up. Experiments on corn starch and silica suspensions show unexpected phenomena such as formation of satellite and sub-satellite droplets connected by thin threads. While the project is still in the development phase, it promises to yield data that could lead to further insights into the rheology of shear thickening suspensions, particularly the regime map where the phenomenon exists.