



Topical Research Meeting on Physics in Food Manufacturing

Session: Simulation

Modelling the emergent flow behaviour of emulsions

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Emulsions are found throughout various food products, including mayonnaise, milk, and beer; hence knowledge of how they flow is valuable. These non-Newtonian fluids and their properties impact every stage of the food product life cycle, from efficiency in design and manufacture to taste and texture in consumption.

The rheology of emulsions depends upon many factors including the droplet concentration, surface tension, viscosity ratio, and shear rate. Approximate theoretical and empirical models exist to describe some of these effects, but these are limited in applicability. Investigations into these factors have been undertaken, using a newly developed meso-scale computational model solving the droplet physics allowing for the prediction, evaluation and creation of macroscale models incorporating the mentioned factors.