UNIVERSITÀ DEGLI STUDI DI BERGAMO
Dipartimento di Ingegneria e Scienze applicate

Seminars within the frame-work of DROPIT project
in collaboration with Universität Stuttgart,
Università degli studi di Bergamo and Università di Trento

Thursday 14th December and Friday 15th December 2017, 9:00 am
Engineering Campus (Building C, Room C302)

Modelling of drop heating and evaporation

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Abstract

The classical (the Abramzon and Sirignano model) and most recent developments in the modelling of heating and evaporation of fuel droplets will be presented, and the most important unsolved problems will be discussed. Analyses of hydrodynamic, kinetic and molecular dynamic models, taking and not taking into account quantum-chemical effects, will presented. New results in modelling heating and evaporation of non-spherical (spheroidal) droplets will be summarised. Basic principles of the Discrete Component Model and its applications, including those to biodiesel fuel droplets, will be described. The main ideas of the Multi-dimensional Quasi-discrete Model and its applications to Diesel and gasoline fuel droplets, and a mixture of biodiesel and Diesel fuel droplets, will be discussed. A self-consistent kinetic model for droplet heating and evaporation will be described and applied to modelling the heating and evaporation of n-dodecane and a mixture of n-dodecane (approximation of alkanes in Diesel fuel) and p-dipropylbenzene (approximation of aromatics in Diesel fuel) droplets. New approaches to the analysis of the interaction between the molecules and the surfaces of the droplets and estimation of the evaporation coefficient, including those taking into account quantum-chemical effects, will be summarised.

For more information, please contact Prof. G.E. Cossali, cossali@unibg.it