

Heat Transfer and Phase Change Simulation in COMSOL Multiphysics® Software

N. Huc¹

¹COMSOL France, Grenoble, France

Abstract

This session is devoted to phase change modeling in heat transfer simulations. The great interest in phase change comes from the outstanding thermal performance that it enables in particular for cooling or thermal protection applications. Alternatively, phase change can induce most of the energy cost in drying or cooking applications. In all of these cases, a thermal analysis is required to account for the phase change process in addition to conduction, convection, and radiative heat transfer. Because the underlying physics is complex, assumptions and simplification are required.

This session will offer an overview of the methods available in the Heat Transfer Module through built-in features and physics interfaces as well as the example models and applications in the corresponding Application Library.

Criteria for reliable simulation of phase change will be discussed, as well as common issues observed in pure heat transfer and multiphysics simulations.

Several aspects of heat transfer and phase change simulation in COMSOL Multiphysics® software will be illustrated in this session in presentations by experienced simulation experts including David Fu from Tyson Foods and Charles Dubois from the École Polytechnique de Montréal.

Discussion will follow the presentations.