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Rodrigo Zelada Mancini - Shape Optimization with discontinuities

lundi 3 juin 2024 10:30 (30 minutes)

This presentation focuses on a shape optimization method
applied to fluid-to-fluid heat exchangers with Ventcell boundary conditions. We cosider a framework of two fluids separeted by a thin layer, where the Ventcell type boundary condition is got through an asymptotic analysis of order two of the transmission problem at the thin layer interfaces with respect to the thickness parameter. Due to this approximation, the multi-physics problem is reduces as a weak-coupled problem, between the steady-state Navier-Stokes equations for the two fluids dynamics and the convection-diffusion equation for the heat. We characterize the shape derivative for the objective functionals and perform numerical simulations in two and three dimensions to obtain an optimum heat exchanger.