

Leila Rahmani (Tizi-Ouzou)

Title. Asymptotic analysis and derivation of Ventcel -type conditions for mechanical structures with thin layers

Abstract. In this talk, we investigate the mathematical modeling of the behavior of mechanical structures involving thin layers. We focus on transmission problems, where the behavior of the structure is governed by a system of partial differential equations, together with boundary and transmission conditions describing the interaction between the layer and the rest of the structure. To overcome the numerical difficulties arising from the presence of the thin layer, we use asymptotic analysis with respect to its thickness. This leads to the derivation of simplified approximate models that do not involve the thin layer geometrically, but account for its effect through new effective Ventcel-type boundary or transmission conditions, depending on its configuration within the structure. Particular attention is given to how the layer's physical properties affect the behavior of the structure.