

Mircea Sofonea (Universidad de Perpignan, Francia)

“Implicit Sweeping Process Arguments in Contact Mechanics”

Abstract: The aim of this paper is show that, besides the classical tools provided by the theory of variational inequalities, sweeping process arguments can be successfully used in the study of contact problems. To this end we revisit a mathematical model which describes the equilibrium of a viscoelastic body in frictional contact with a foundation. We list the assumptions on the data and derive a new variational formulation of the model, in the form of a sweeping process for the strain field. Inspired by this formulation, we consider an abstract in sweeping process in a real Hilbert space for which we state and prove an existence and uniqueness result. We apply this result to deduce the unique weak solvability of the viscoelastic contact problem. Finally, we provide some mechanical interpretations and concluding remarks.