

**History-dependent contact problems: numerical approximation using penalization
and regularization methods**

Flavius Pătrulescu

Tiberiu Popoviciu Institute of Numerical Analysis, Romanian Academy, Cluj-Napoca

fpatrulescu@ictp.acad.ro

Abstract: We consider some recent mathematical models in Contact Mechanics. The process is quasistatic and the contact is modelled with new and nonstandard conditions which involve memory effects. We provide the unique weak solvability using arguments of history-dependent variational inequalities. Moreover, we apply the penalization and regularization methods to approximate the weak solution. Finally, we give some numerical simulations.