A velocity-based time-stepping scheme for vibro-impact problems

L. Paoli

LaMUSE, University of Saint-Etienne,
23 rue P.Michelon, 42023 Saint-Etienne Cedex 2, FRANCE.

We consider a mechanical system with a finite number of degrees of freedom and a non trivial inertia operator submitted to a perfect unilateral constraint. We assume that the transmission of the velocity at impacts is governed by Newton's law with a restitution coefficient $e \in [0, 1]$. Then, starting from the measure-differential formulation of the problem given by J.J. Moreau, a velocity-based time-stepping scheme is derived, directly inspired by the catching-up algorithm for sweeping processes and the convergence of the approximate solutions is proved.