Journal of Convex Analysis, Vol. 4, No. 2, pp. 381-393 (1997)

Measure-Differential Inclusions in Percussional Dynamics

M. Laghdir and Manuel D. P. Monteiro Marques

Faculté des Sciences, Rabat, Maroc, and Centro de Matematica e Aplicacoes Fundamentais, Universidade de Lisboa, Av. Prof. Gama Pinto 2, 1699 Lisboa Codex, Portugal, mmarques@ptmat.lmc.fc.ul.pt

Abstract: We give an existence result for the dynamics of a system of particles moving on a line in a horizontal plane and subjected to friction, to percussional effects, to stiffness and to damping. The novelty in our study is that the normal reaction is expressed by a measure, incorporating a series of Dirac measures. The velocity is a function of bounded variation and the acceleration is its Stieltjes measure. Together with the tangential reaction - which is also a measure - they must satisfy a measure-differential inclusion formulation of friction. Convex analysis, variational inequalities and measure theory are used in the existence proof.

Keywords: Particle dynamics, normal percussions, bounded variation, measure-differential inclusions

Classification (MSC2000): 34A37, 34A60, 70F30

Full text of the article:

- Compressed PostScript file (88 kilobytes)
- PDF file (206 kilobytes)

[Previous Article] [Contents of this Number]