

IMPACT/CONTACT OF ELASTIC BODY ON A MOVING FOUNDATION*

C. M. Murea[†]

DOI <https://doi.org/10.56082/annalsarscimath.2023.1-2.352>

Dedicated to Dr. Dan Tiba on the occasion of his 70th anniversary

Abstract

We study numerically the dynamic impact/contact of an elastic body on a moving foundation using the mid-point algorithm. Stability results are presented when foundation is decreasing. Numerical simulations on two-dimensional problems are included and we show that the energy is absorbed in the case of decreasing foundation compared to the fixed one.

MSC: 74H15, 74S05, 65M12

keywords: dynamic elasticity, frictionless contact, numerical methods, stability

1 Introduction

Several numerical methods have been developed for elastodynamic contact problem, see the textbook [7], [9], [17] or the survey papers [5], [8]. The contact constraint can be treated using: Lagrange multiplier, augmented Lagrangian, penalty methods, etc. We add also the Nitsche based methods [1], [2]. Updated Lagrangian methods for elasticity with contact are described in [18] and [11].

*Accepted for publication on April 27-th, 2023

[†]cornel.murea@uha.fr Département de Mathématiques, IRIMAS, Université de Haute Alsace, France