

## Abstract

The design of magnetorheological materials with mechanical properties adjusted to the action of dynamic loads is a recent field of research. The few bibliographic literatures in this area concern the beams. This paper is devoted to a numerical and an experimental study of the dynamic behavior of sandwich plates consisting of two aluminum skins and a magnetorheological elastomer (MRE) core of different loads of micron-size ferromagnetic particles elaborated under the action of a magnetic field. Firstly, the rheological properties of the loaded elastomer with and without the impact of the magnetic field have been evaluated experimentally. Secondly, an experimental analysis of the impact of the loading rate of micron-size ferromagnetic particles of the elastomer as well as the magnetic field intensity on the vibration behavior of the elaborated plates is conducted. To evaluate the variation of the plate rigidity and damping factor, a confrontation of experimental values against numerical results, using the finite elements software Abaqus and the Ritz method of approximation for an appropriate model, was made for various dimensions and boundary conditions of the plate