

## Abstract

The purpose of this work is to analyze the nonlinear magneto-mechanical behavior of sandwich structures with a magnetorheological elastomer (MRE) core subjected to a permanent magnetic field. A detailed study is first carried out to characterize the mechanical behavior of these structures. The tests were carried out in three-point bending on beams of these complex materials for several distances between supports. An experimental study of the static response, is realized using a Zwick 2.5kN machine, allows to measure displacements as a function of force. The results deduced from the numerical simulation by the Abaqus software are compared with those obtained from the theoretical analysis. This study made it possible to show that these structures exhibit a non-linear behavior even at small deformations due to the rheological parameters which are more sensitive by the application of a magnetic field.