

## **Conservative algorithms for time integration of elastodynamic response in finite strains**

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### **SUMMARY**

A numerical model for the algorithmic treatment of the dynamic response of hyperelastic bodies in finite strains is here applied to non-linear hyperelastic continua. The main goal is to point out the conditions allowing the fulfilment of linear and angular momentum conservation and the conservation of total energy. The application of a generalised mid-point rule for time integration and use of a particular algorithmic form of the symmetric Piola-Kirchhoff stress tensor preserve the exact conservation of total linear and angular momentum and the exact conservation of energy for general hyperelastic bodies ensuring also a second order accuracy. Some examples related to a particular hyperelastic constitutive model are shown to remark the properties of the algorithm. The examples were processed using an object-oriented f.e.m. software.

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