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A modal multifield approach for an extended flexible body description in multibody dynamics.
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Abstract. This paper presents a new methodology to simulate the behaviour of flexible bodies influenced by multiple physical field quantities in addition to the classical mechanical terms. The theoretical framework is based on the extended Hamilton Principle and an adapted modal multifield approach. Furthermore, the use of finite element analysis for the necessary data preprocessing is explained. Numerical solution strategies for the coupled system of differential equations with different time scale properties are mentioned. The method is applied to simulate a structure with distributed piezoceramic devices inducing an additional electrostatic field. Two thermoelastic problems, which have to consider the influence of spatial temperature distribution, also demonstrate the benefits of the presented approach.

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