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DATA-BASED INELASTIC CONSTITUTIVE MODELS IN THE FRAMEWORK OF COSSERAT RODS

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As shown in [1], cables are often modeled in terms of Cosserat rods, since this theory represents a versatile and self consistent tool to describe large spatial deformation of slender structures under the effect of small local strains.
When performing bending experiments with electric cables, inelastic complex behavior arises due to the multimaterial composition of such objects and hysteretic loops occur, with noticeable difference between the first loading cycle and the following ones [2].
Our approach aims at modeling effective inelastic constitutive behavior described using hysteresis operators [3], whose parameters are derived from measured data. One of the main features of this mathematical tool is represented by its versatility and the fact that not too many *a priori* assumptions with regard to material properties are required.
In this contribution, first steps to include a history dependent constitutive law expressed as hysteresis operators into a Cosserat rod model are made, and first simulation results are shown.

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