Three Lie group DAE time integration methods tested on a Cosserat rod model

Stefan Hante (Martin-Luther-Universität Halle-Wittenberg), Martin Arnold

We will consider three Lie group DAE time integration methods: Firstly, the generalized-α Lie group method, which slowly gains popularity in multi-body simulation, secondly the BLieDF Lie group method, which is a recently developed multistep method based on the popular BDF methods and lastly a variational integrator which is a Lie group analogon to the well-known SHAKE and RATTLE integration schemes.
All three Lie group DAE time integrators are implemented in Fortran and are applied to a nontrivial constrained Cosserat rod model in order to compare performance, accuracy and energy behaviour.