

Abstract Submitted
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Variational integrator preserving Lie-symmetry MARX CHHAY,
Univ. La Rochelle, France — Many physical systems can be expressed with a Lagrangian formalism. The underlying role of the variational symmetries occurring in the computation of the dynamics equation reveals the intrinsic conservation properties of the system. For numerical design, it is well-known that the discrete version of the variational derivation of finite dimensional time independent Lagrangian systems yields a symplectic integrator that preserves exactly the discrete energy when the time step is considered as a variable. But it is not enough for the integrator to preserve the other conservation laws. Indeed the discrete Lagrangian must also be invariant under the variational symmetries. Such Lie-symmetry variational integrators can be constructed thanks to the concept of moving frames. Numerical properties are shown on academic examples.

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