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	abstract	Reduced magnetohydrodynamics is a simplified set of magnetohydrodynamics equations with applications to both fusion and astrophysical plasmas, possessing a noncanonical Hamiltonian structure and consequently a number of conserved functionals. We propose a new discretisation strategy for these equations based on a discrete variational principle applied to a formal Lagrangian. The resulting integrator preserves important quantities like the total energy, magnetic helicity and cross helicity exactly (up to machine precision). As the integrator is free of numerical resistivity, spurious reconnection along current sheets is absent in the ideal case. If effects of electron inertia are added, reconnection of magnetic field lines is allowed, although the resulting model still possesses a noncanonical Hamiltonian structure. After reviewing the conservation laws of the model equations, the adopted variational principle with the related conservation laws are described both at the continuous and discrete level. We verify the favourable properties of the variational integrator in particular with respect to the preservation of the invariants of the models under consideration and compare with results from the literature and those of a pseudo-spectral code.Comment: 35 page	**abstract**	Reduced magnetohydrodynamics is a simplified set of magnetohydrodynamics equations with applications to both fusion and astrophysical plasmas, possessing a noncanonical Hamiltonian structure and consequently a number of conserved functionals. We propose a new discretisation strategy for these equations based on a discrete variational principle applied to a formal Lagrangian. The resulting integrator preserves important quantities like the total energy, magnetic helicity and cross helicity exactly (up to machine precision). As the integrator is free of numerical resistivity, spurious reconnection along current sheets is absent in the ideal case. If effects of electron inertia are added, reconnection of magnetic field lines is allowed, although the resulting model still possesses a noncanonical Hamiltonian structure. After reviewing the conservation laws of the model equations, the adopted variational principle with the related conservation laws are described both at the continuous and discrete level. We verify the favourable properties of the variational integrator in particular with respect to the preservation of the invariants of the models under consideration and compare with results from the literature and those of a pseudo-spectral code.		
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