

*Multi-symplectic discretisation of wave map equations*

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We present a new multi-symplectic formulation of constrained Hamiltonian partial differential equations, and we study the associated local conservation laws. A multi-symplectic discretisation based on this new formulation is exemplified by means of the Euler box scheme. When applied to the wave map equation, this numerical scheme is explicit, preserves the constraint and can be seen as a generalisation of the SHAKE algorithm for constrained mechanical systems. Furthermore, numerical experiments show excellent conservation properties of the numerical solutions.