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Shun Sato (talk 1): On the stability of multi-symplectic diamond schemes

Tuesday, June 10, 2025 10:30 AM (45 minutes)

Evolutionary partial differential equations (PDEs) sometimes have multi-symplectic structures.
For these PDEs, multi-symplectic integrators, numerical methods inheriting the structures, have been widely studied.
In this direction, McLachlan and Wilkins proposed multi-symplectic diamond schemes which use a special mesh called a diamond mesh to fully leverage the local nature of PDEs.
Their method is superior in the sense that it preserves multi-symplecticity, can achieve arbitrarily high-order, and is computationally inexpensive.
However, they applied their method only to simple nonlinear wave equations.
In this talk, we apply their method to a broad class of multi-symplectic PDEs and explore potential stability issues.
This is a joint work with Kaito Sato and Takayasu Matsuo.