Volume-Preserving Numerical Methods

Dr. Andy Wan [1]

For many dynamical systems, such as from classical mechanics, statistical mechanics and incompressible fluid flows, volume-preservation is an important property for understanding their long-term dynamics. While the solutions of these dynamical systems naturally preserve their volumes, numerical approximations of these solutions are in general not volume-preserving. In this talk, we will review a special class of numerical methods called volume-preserving numerical methods discovered in the recent decades. We will also discuss new results on volume-preserving conservative methods.

[1] Department of Mathematics and Statistics, University of Northern British Columbia, Prince George, BC, V2N4Z9, Canada (andy.wan@unbc.ca).