Meshfree Integrators for Evolution Equations

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Abstract: We present a class of meshfree exponential integrators for the numerical solution of time-dependent partial differential equations, whose solutions concentrate on a small part of the computational domain and are moving in time. For the space discretization, compactly supported radial basis functions are suggested. The evolution in time is carried out by exponential integrators or splitting methods. The proposed integrators are fully adaptive in space and time. Theoretical aspects as well as numerical examples that illustrate the robustness and the good stability properties of these methods are discussed.

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