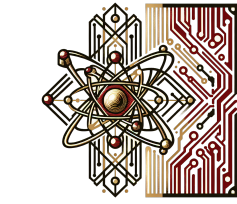


On Learning Quasi-Lagrangian Turbulence

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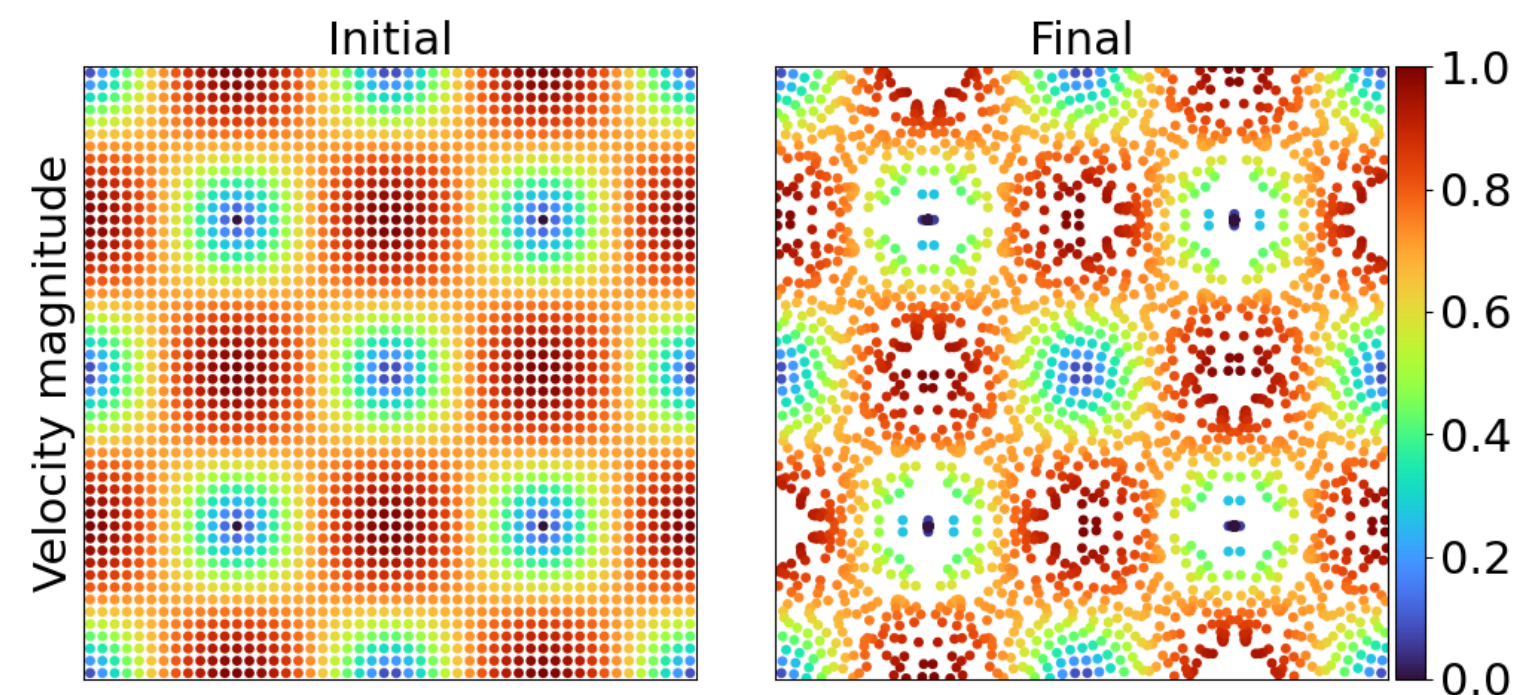
Overview

Motivation: Limited progress in classical Lagrangian turbulence modeling.

Our contribution:

1. Justification for quasi-Lagrangian approach.
2. Dataset generation recipe.
3. Comparison of ML parametrizations.

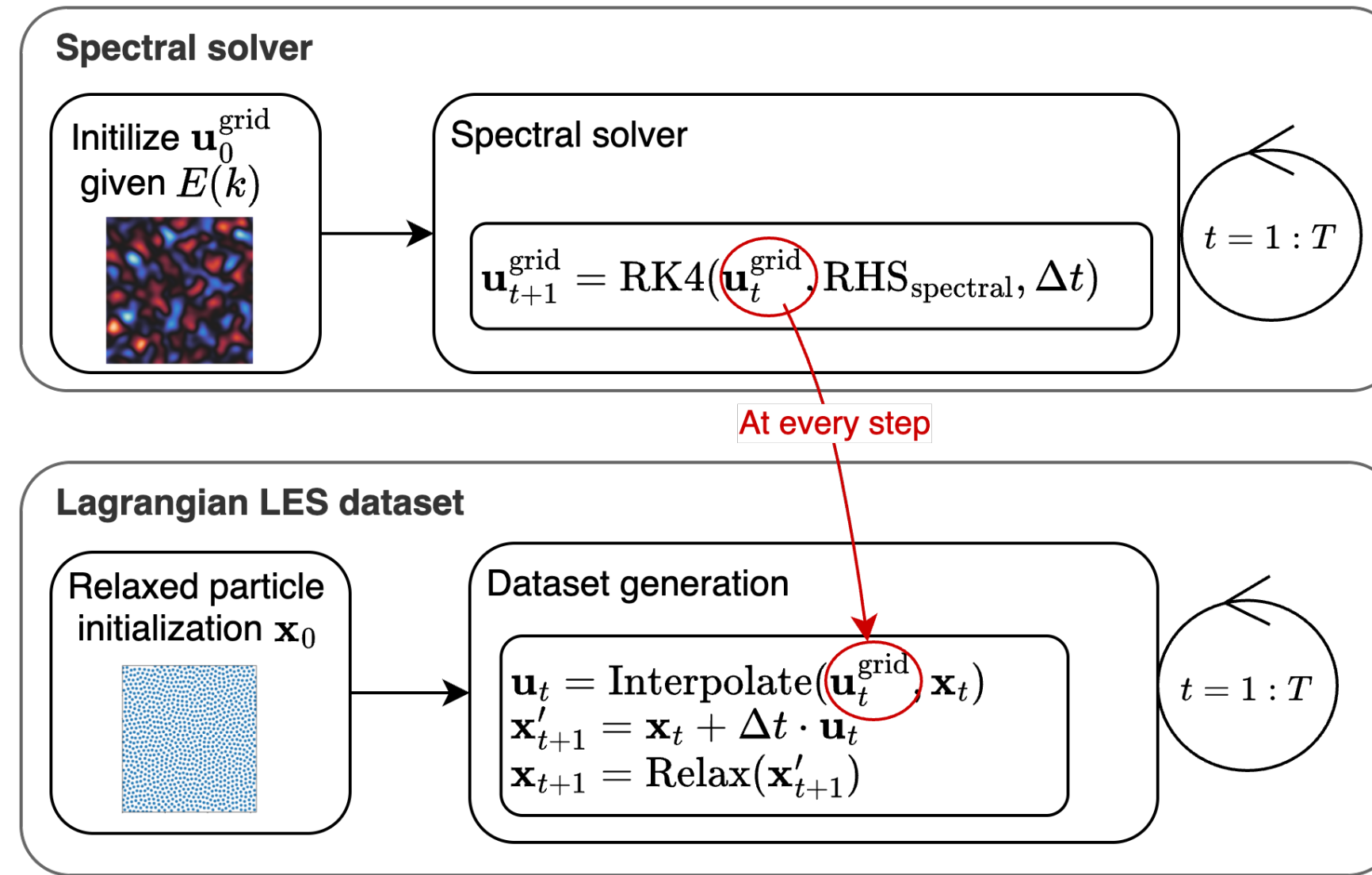
1. Why not simply Lagrangian?



50^2 passive tracer particles advected along the ground truth Taylor-Green solution.

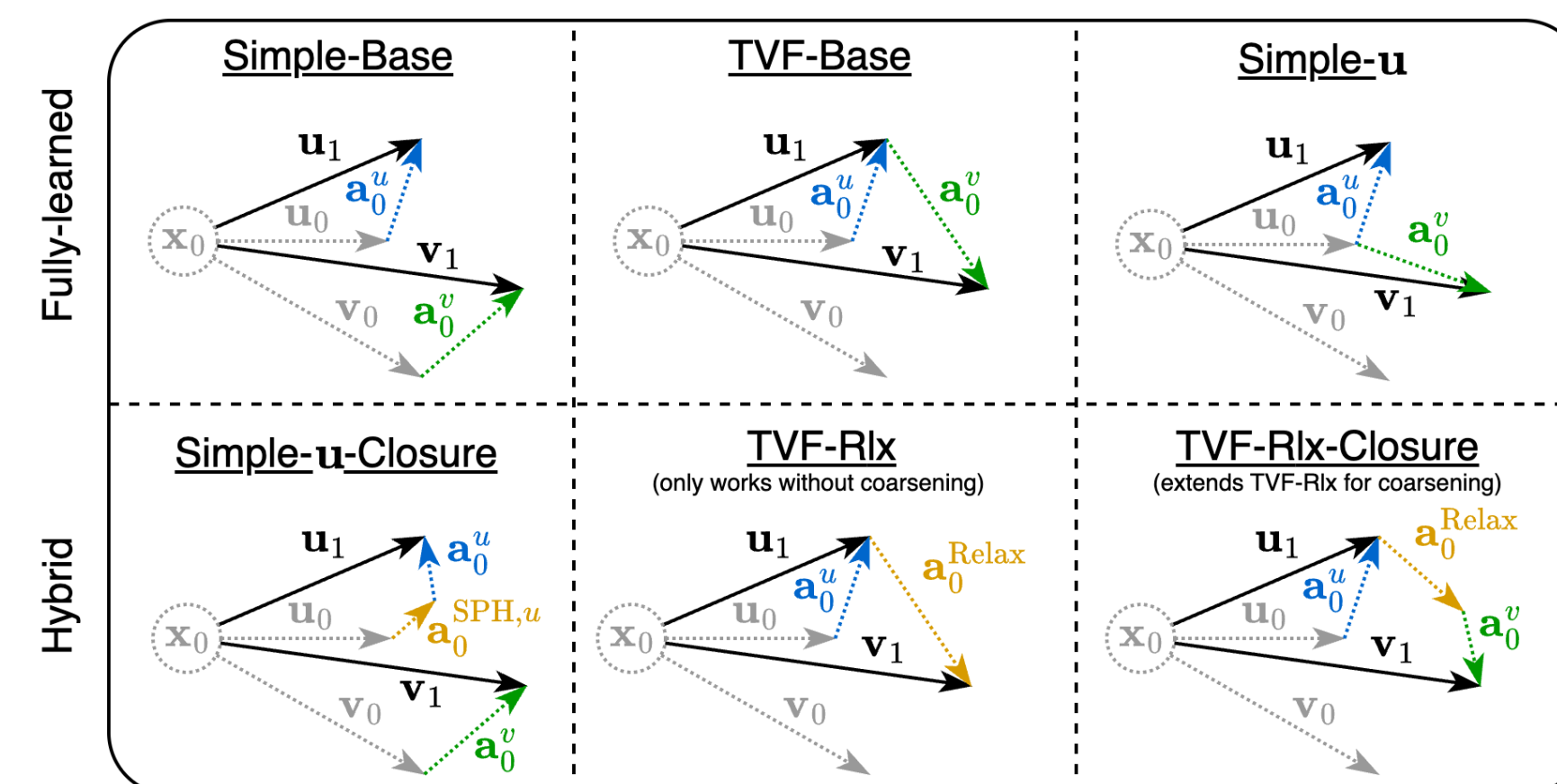
- Tracer particles $\neq$ Lagrangian SPH particles.
- Only tracers recover the energy spectrum.

2. Dataset Construction

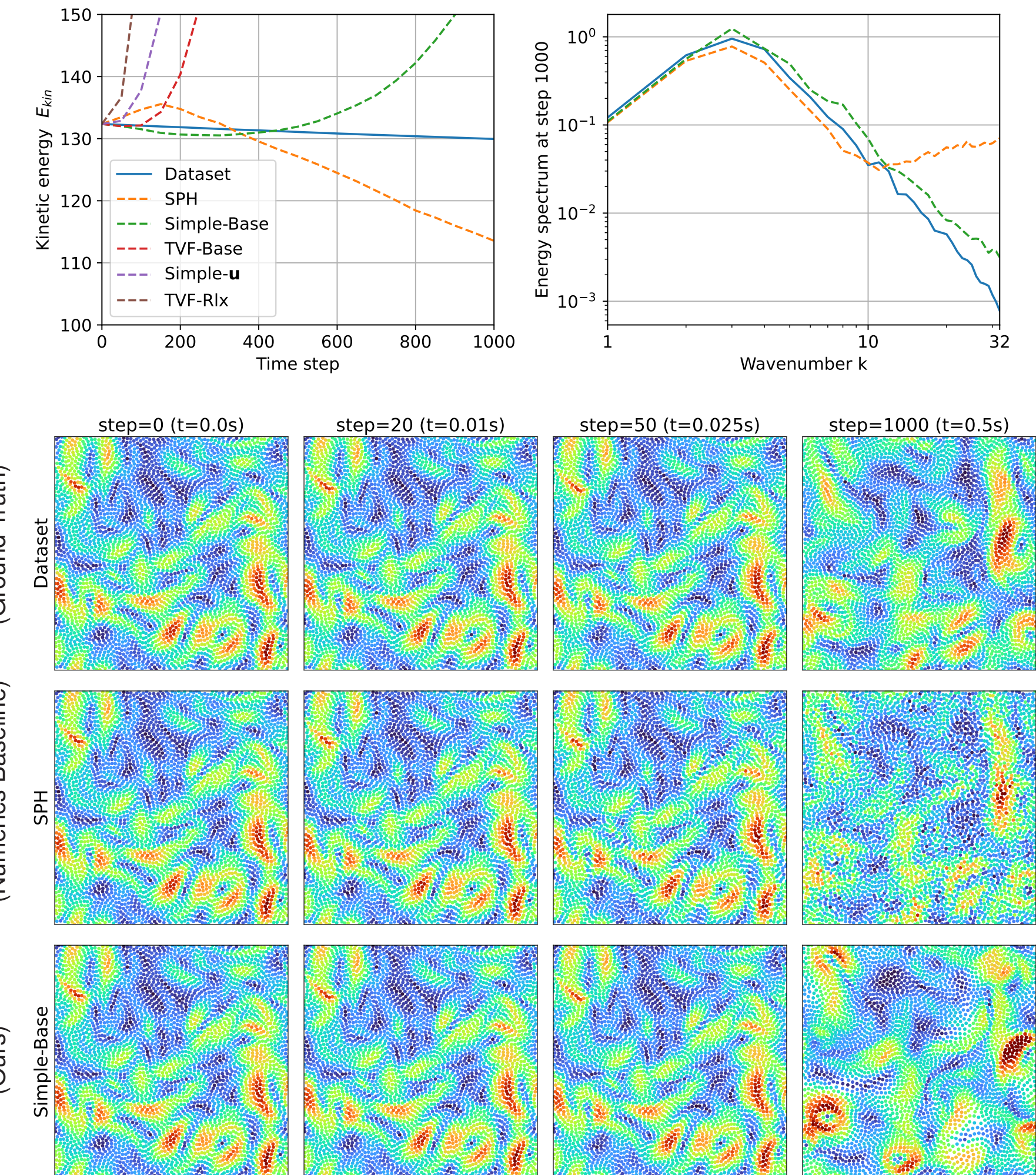


3. Proposed Parametrizations

$$\mathbf{a}_0^u, \mathbf{a}_0^v = GNN(\mathbf{u}_0, \mathbf{v}_0)$$



Results on Kolmogorov 2D



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