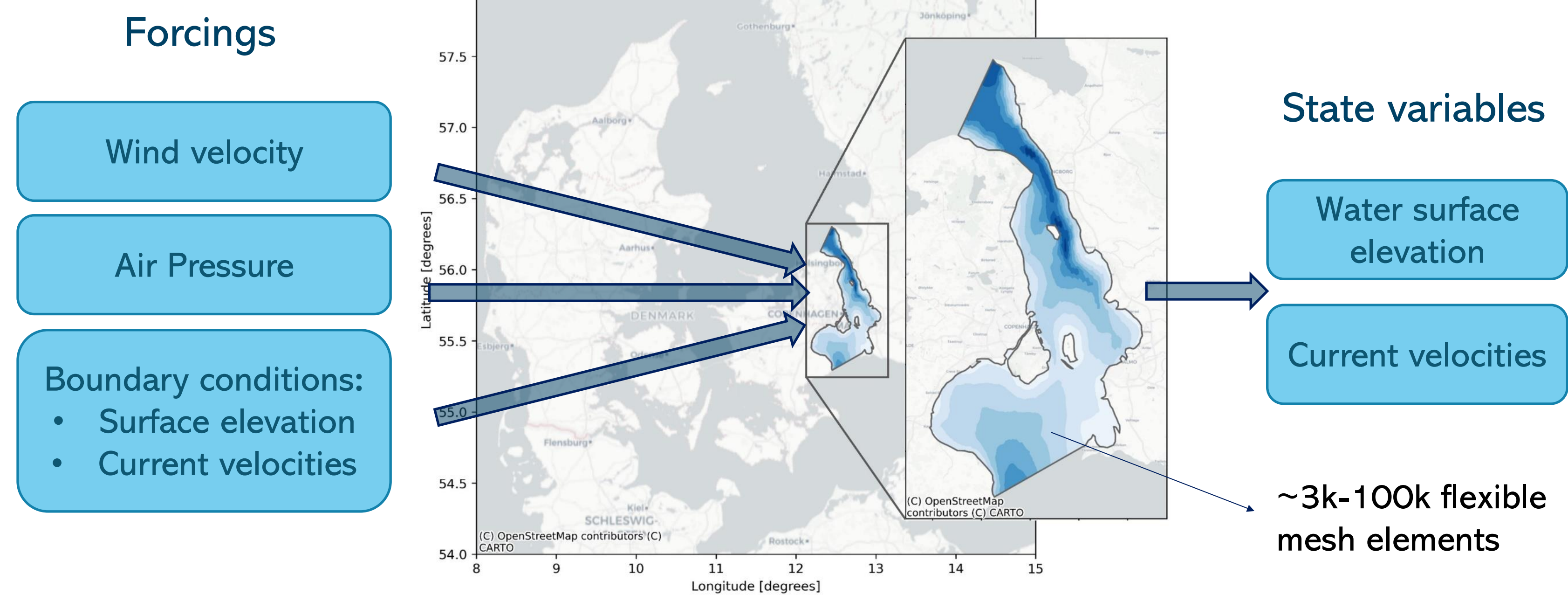
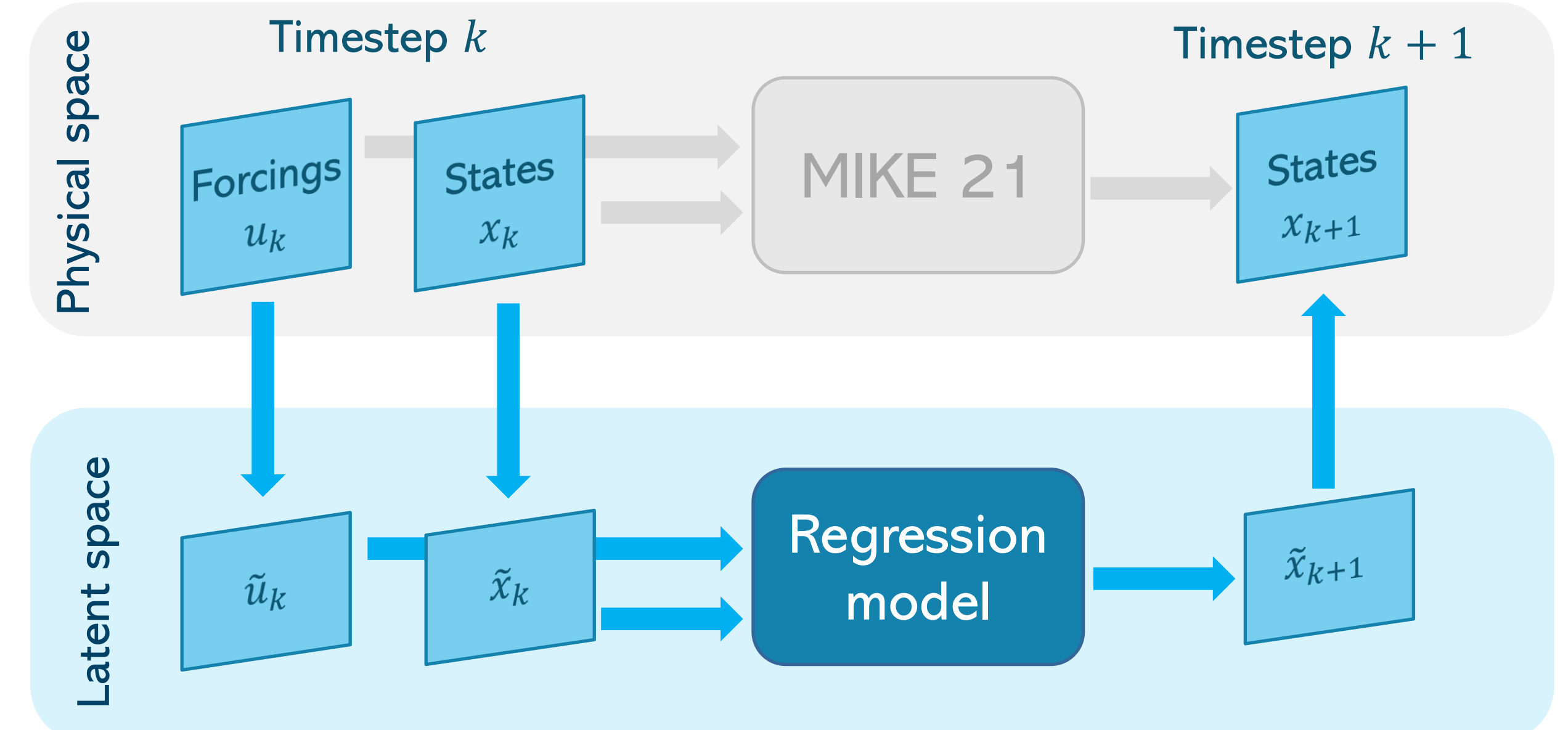


## MIKE 21 Flow Model FM



## Surrogate model



# How to ensure stability and robustness in a data-driven reduced order model?

## Goal

Factor 1000 speed-up

## How?

Reducing dimension

## Why?

New workflows, e.g. Ensemble and climate scenario forecasts

Robust and stable

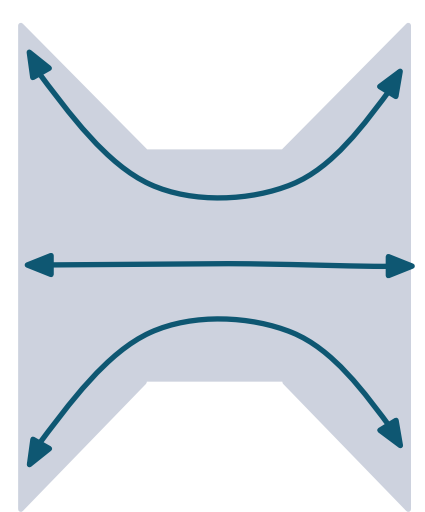
Physical constraints, controlling eigenvalues

To use for reliable real-world modeling

## Approach: Datadriven autoencoder

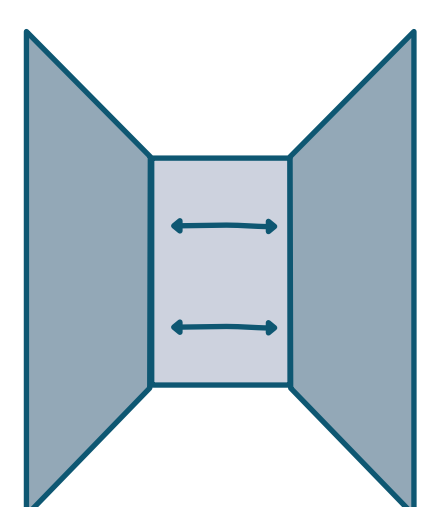
### Koopman Autoencoder

- End-to-end differentiable training

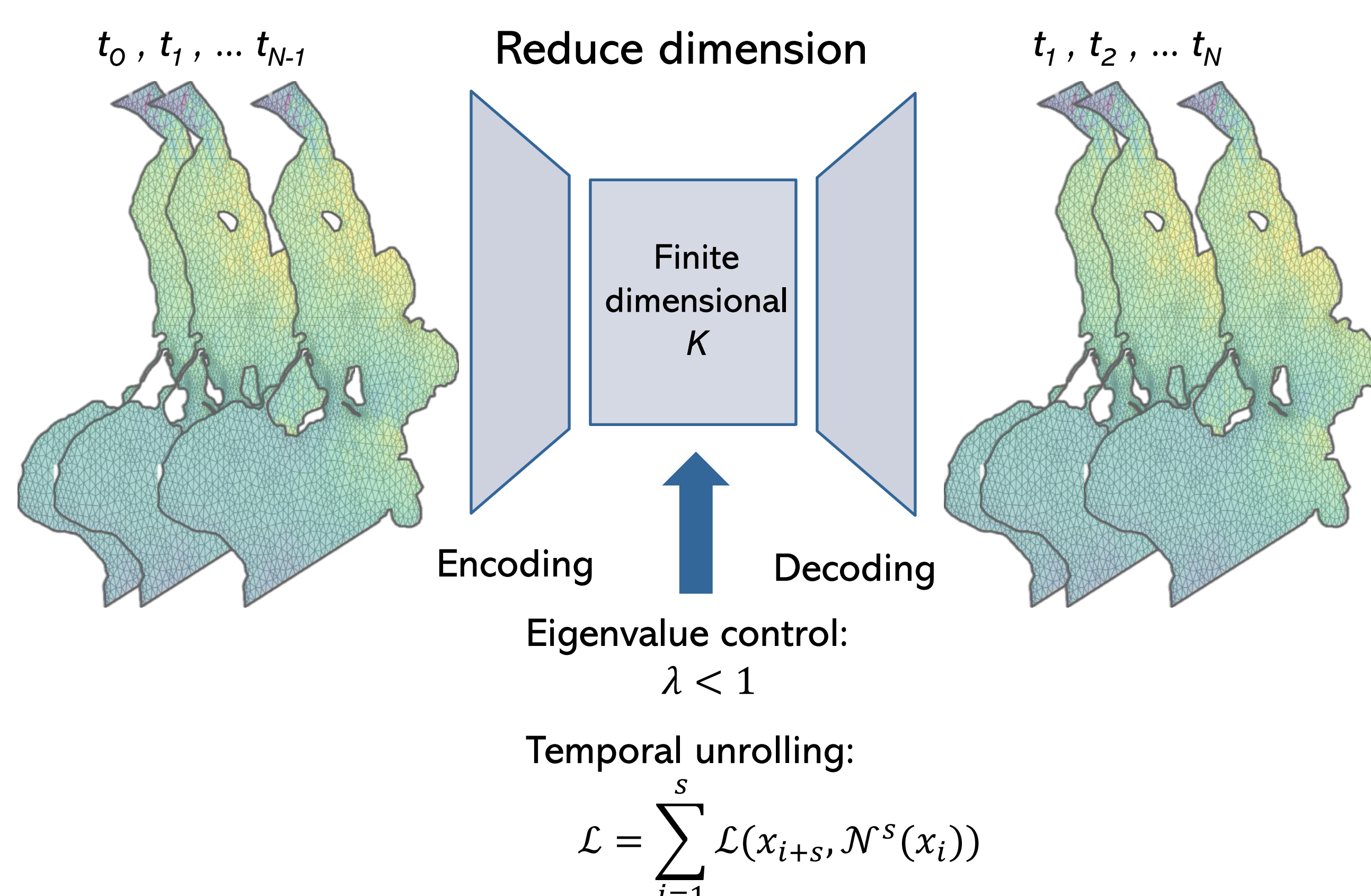


### Proper orthogonal decomposition with linear regression (PODLR)

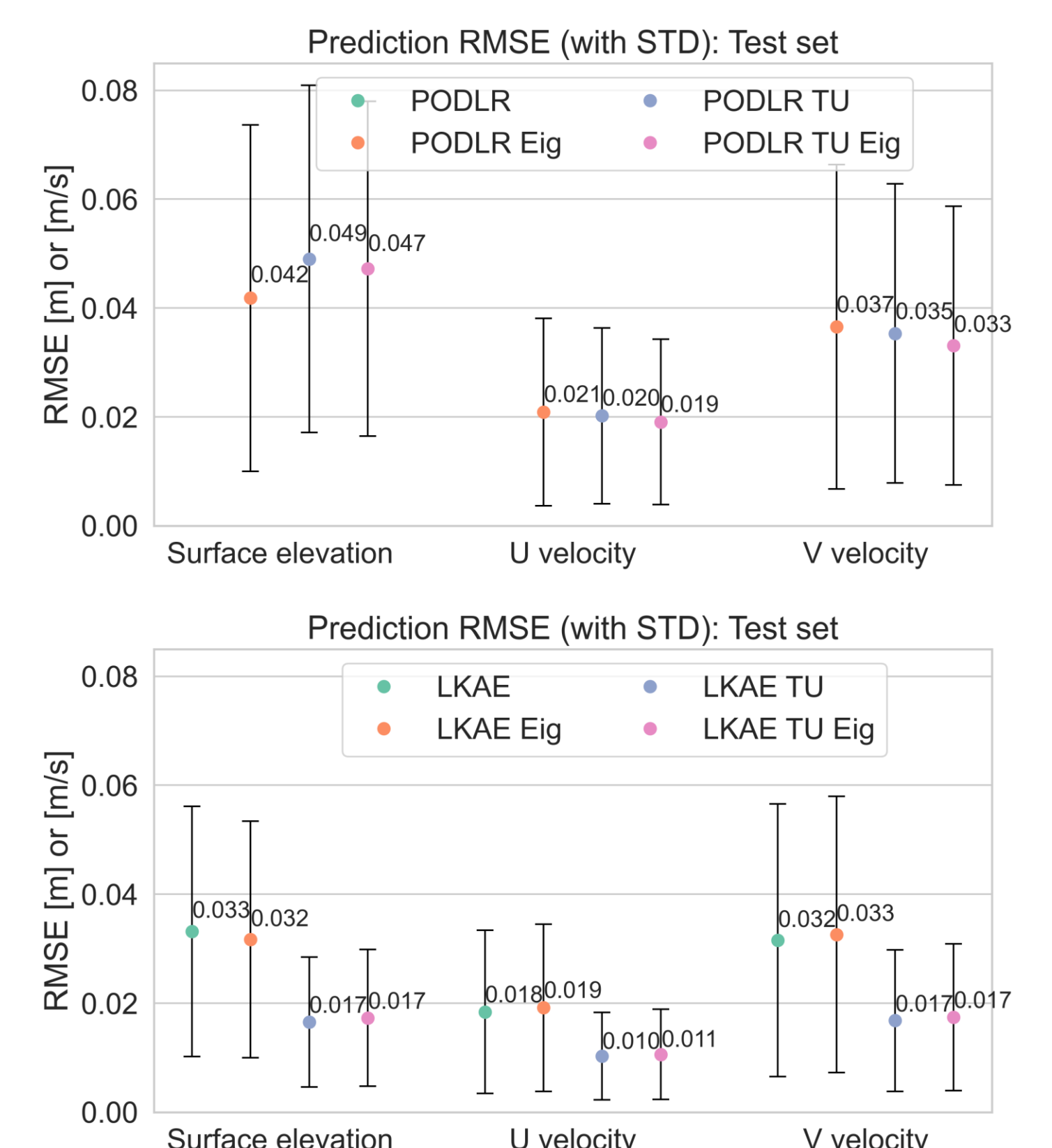
- Non-differentiable autoencoder, differentiable training of LR



### Autoencoder structure



### Preliminary results



Contact

Feel free to reach out to [frtp@dhigroup.com](mailto:frtp@dhigroup.com) for any questions, comments or feedback.



Stay in touch!