

Regional High-Resolution Weather Forecasting over the Arabian Peninsula: A Data-Driven Approach Sofien Resifi¹, Elissar Al Aawar¹, Hari Prasad Dasari¹, Hatem Jebari¹, and Ibrahim Hoteit¹ 1. Department of Physical Science and Engineering, King Abdullah University of Science and Technology (KAUST), Thuwal, Saudi Arabia

ntroduction

- High-resolution forecasting is essential for capturing local events and fine-scale atmospheric features.
- **Physical models** are computationally demanding, therefore, **AI** presents a **viable solution** for obtaining efficient high-resolution forecasts.
- We studied two forecasting approaches: **recursive and downscaling**, and proposed merging them in a unified framework for better forecast performance.

Dataset

- Long-term reanalysis data generated by an assimilative configuration of WRF.
- 42 years(1980-2022).



Figure 1: The Arabian Peninsula



Results







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