ERA5 500 hPa — Spherical vs Baseline

Project: ERA5 500 hPa Winds — Spherical vs Baseline | Data: ERA5 (500 hPa), vars: u, v | Grid: 64 x 128 (lat-lon) | Context Length (T): 2 | OS/Env: Windows-native PyTorch (no WSL/Docker/Dask)

Executive Summary

This report summarizes fast evaluation metrics comparing a Spherical model against a Baseline model for wind prediction (u, v) on a 64×128 grid with context length T=2. Models were trained and evaluated in a Windows-native PyTorch setup, avoiding WSL/Docker/Dask. The metrics below can be cited directly in a portfolio or resume.

Key Highlights

Metric	Value
baseline.mae	0.55334
baseline.rmse	0.729281
baseline.angle	0.418059
baseline.mag_mae	0.551233
spherical.mae	0.547088
spherical.rmse	0.725049
spherical.angle	0.433556
spherical.mag_mae	0.454593

Full Metrics

Metric	Value
baseline.mse	0.531851
baseline.mae	0.55334
baseline.rmse	0.729281
baseline.angle	0.418059
baseline.mag_mae	0.551233
baseline.div_abs	0.184149
baseline.mse_N	0.626687
baseline.mse_S	0.437015
baseline.score	0.679794

spherical.mse	0.525695
spherical.mae	0.547088
spherical.rmse	0.725049
spherical.angle	0.433556
spherical.mag_mae	0.454593
spherical.div_abs	0.19408
spherical.mse_N	0.623462
spherical.mse_S	0.427929
spherical.score	0.66757
winner	spherical
weights.w_mse	1
weights.w_ang	0.2
weights.w_mag	0.1
weights.w_div	0.05
common_grid.H	64
common_grid.W	128

Reproducibility & Environment

Generated	2025-09-20 11:50:02
OS	Windows 10
Python	3.10.18
PyTorch	2.7.1+cu128
CUDA available	True
Run folder	D:\era5_runs\spherical_vs_baseline_20250919_214736
Artifacts	baseline_weights.pt, fast_eval_metrics.json, spherical_weights.pt

Note: This is a fast report derived solely from saved metrics (no inference, no plotting). For image panels or additional analyses, see the artifacts folder or rerun visualization cells in a stable environment.

Generated automatically from fast_eval_metrics.json. Safe-mode report: no GPU, no plotting libraries, no dataset access.