

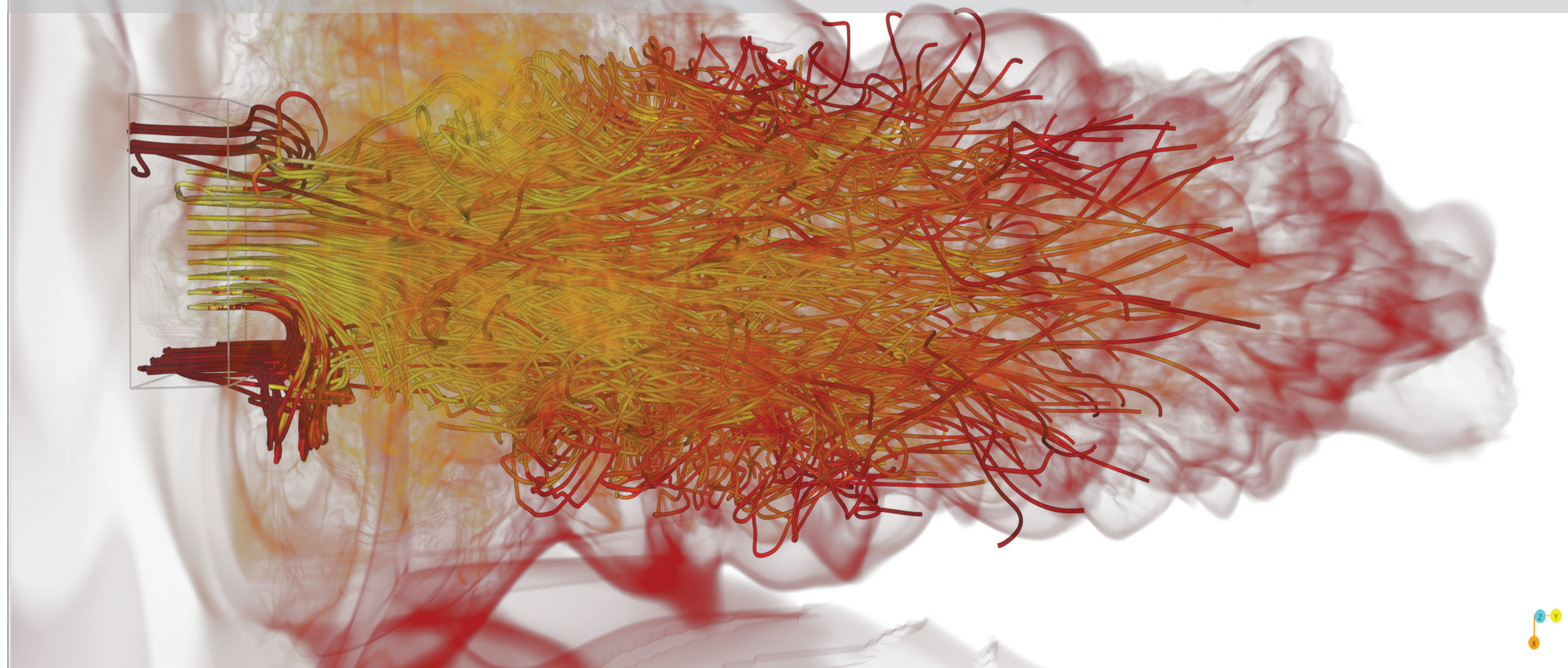
Interactive Visualization of Time-Varying Flow Fields Using Particle Tracing Neural Networks

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Lagrangian-Based Flow Field Explorer

We present a comprehensive evaluation to establish a robust and efficient framework for Lagrangian-based particle tracing using deep learning.



MODEL INFO

Model: ScalarFlow

Bounds:
X Range:[44, 64]
Y Range:[0, 7]
Z Range:[38, 58]

Flow Maps:
Start Cycle: 0.30,60
Stop Cycle: 30.60,90
Interval: 1
Step Size: 0.0167

TRACE PARTICLES

DELETE TRACES

SEED PLACEMENT **SEEDBOX CONFIG**

Display: Active

position_x: 48.9
position_y: 1.75
position_z: 43
size_x: 10
size_y: 3.5
size_z: 10

ADD SEEDS DELETE SEEDS

SCALARS CONFIG **TRANSFER FUNCTION**

Seeds: 1

color by scalar

line segments: 10
line radius: 5

color by scalar

APPLY STYLE

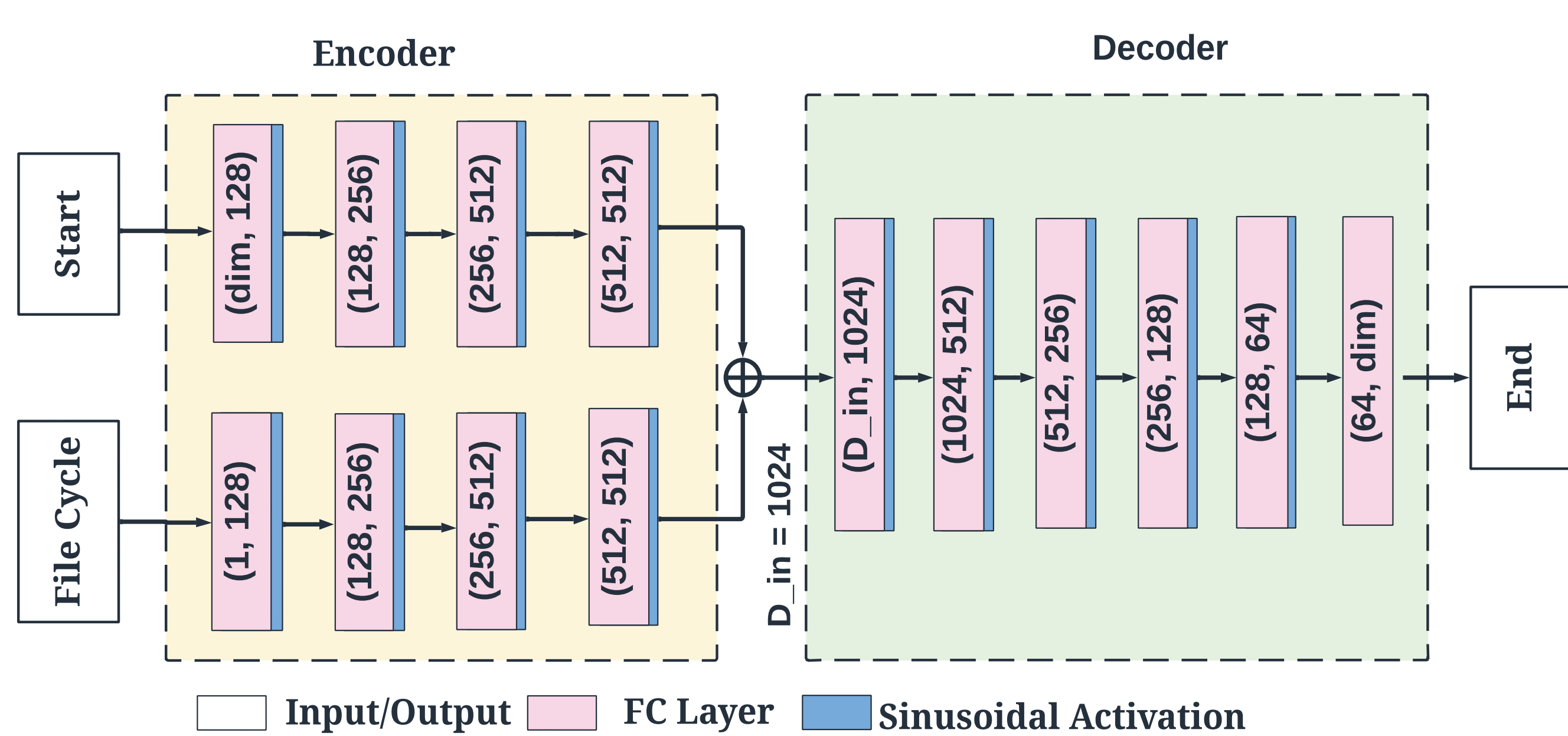
LINE STYLE CONFIG

Seeds: 1

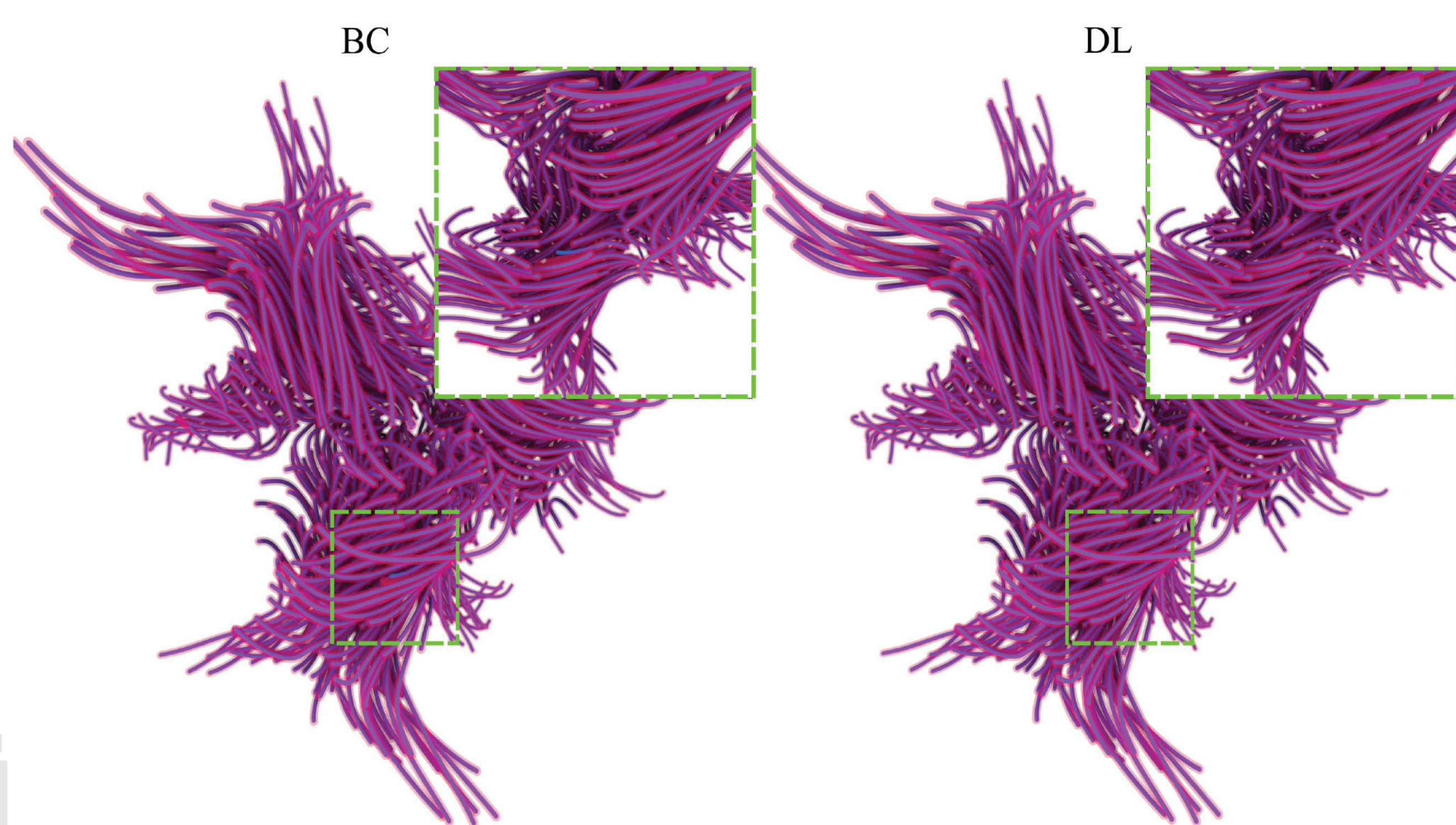
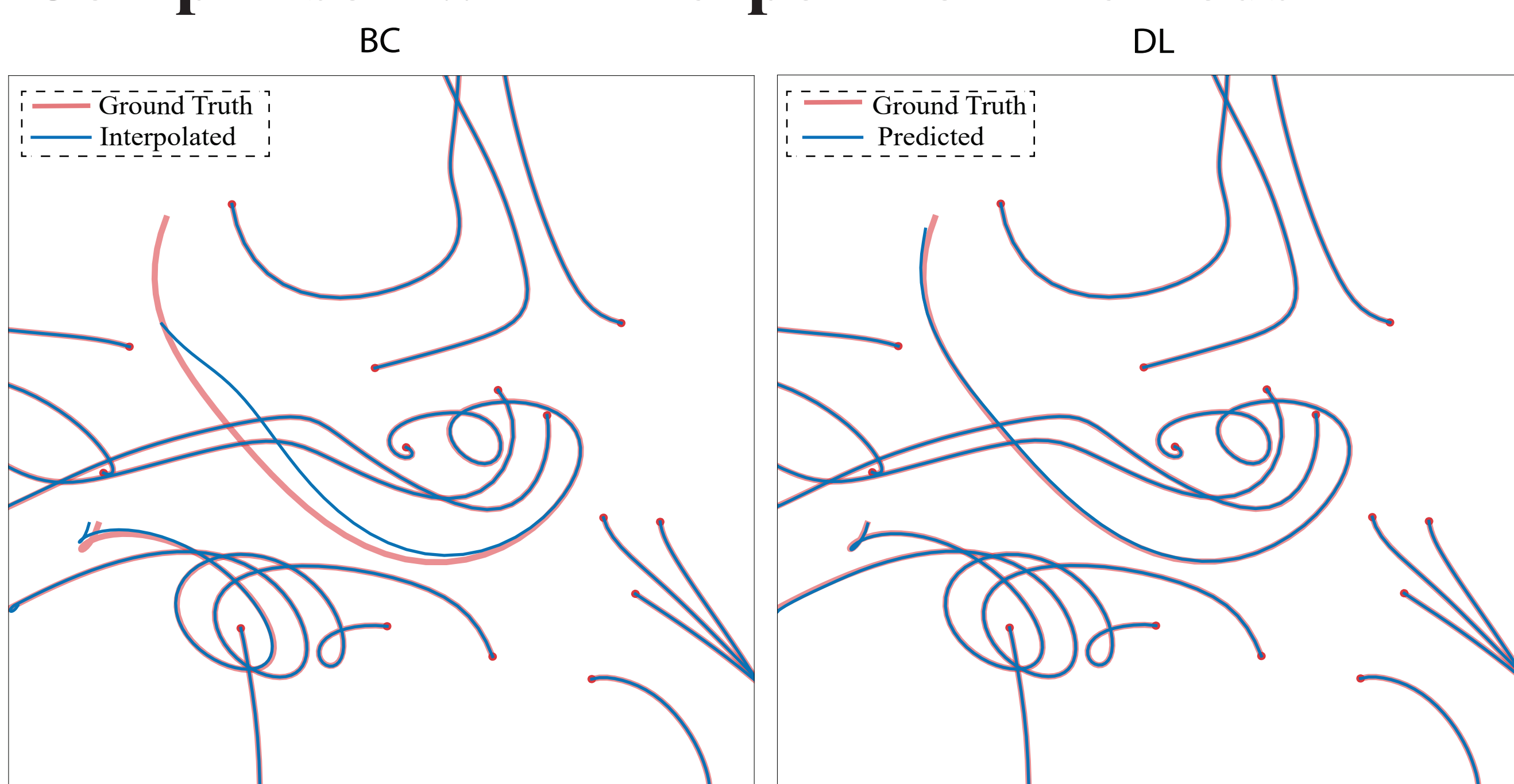
color by scalar

APPLY STYLE

Model Architecture



Comparison with Interpolation Methods



Interactive Visualization Tool for Post Hoc Analysis

Lagrangian-Based Flow Field Explorer

MODEL INFO

Model: ABC

Bounds:
X Range:[0, 6.28]
Y Range:[0, 6.28]
Z Range:[0, 6.28]

Flow Maps:
Start Cycle: 0
Stop Cycle: 100
Interval: 5
Step Size: 0.01

TRACE PARTICLES

DELETE TRACES

SEED PLACEMENT **SEEDBOX CONFIG**

Display: Active

position_x: 1.57
position_y: 1.57
position_z: 1.57
size_x: 3.14
size_y: 3.14
size_z: 3.14

ADD SEEDS DELETE SEEDS

LINE STYLE CONFIG **SCALARS CONFIG** **TRANSFER FUNCTION**

Seeds: 1

color by scalar

line segments: 1
line radius: 1

color by scalar

APPLY STYLE

Integrated with OSPRay for High-Performance Rendering

