



Software for Simulating Atmospheric Turbulence using Phase to Space Transform

**Phase-to-space transform simulator reproduces atmospheric turbulence
300–1000× faster than traditional split-step methods.**

Researchers at Purdue University have developed a new method to simulate atmospheric turbulence. This method uses a new concept known as the phase-to-space transform. Until now, two main approaches have been used to simulate turbulence—split-step propagation and overly simplistic models. Split-step propagation is time-consuming, while the overly simplistic models from the computer vision community are fast, yet miss the fundamental statistics. The Purdue researchers' method combines the speed of the computer vision models and near identical accuracy to split-step.

Technology Validation: The simulator is 300-1000x faster than mainstream split-step simulators.

Advantages:

- faster
- single-pass
- differentiable
- accurate to physical model
- better reconstruction ability

Applications:

- surveillance
- tracking
- detection
- biometrics

Technology ID

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Category

Artificial Intelligence & Machine Learning/Computer Vision & Image Recognition
Aerospace & National Security/Defense, Electronics, & Surveillance Technologies
Automotive & Mobility
Tech/Micromobility & Smart Urban Infrastructure

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- autonomous vehicles

- defense

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Intellectual Property:

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