

Particle Transport in Multiscale Flows

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ABSTRACT

Understanding particle transport in high-speed multiscale turbulent flows is crucial for numerous applications, including biotransport, waste disposal, mining, and hydro-energy production. For example, simulation methods play a vital role in predicting particle sedimentation driven by high-speed flows, which is essential for environmental monitoring. This invited session aims to showcase recent advancements in computer simulation methods and theory for particle transport in various flows and their applications in diverse fields. Topics of interest include, but are not limited to:

1. Particle transport in multiscale flows, multiphase flows, turbulent flows and their applications
2. Theoretical advancements in computational fluid dynamics
3. The integration of machine learning with computational fluid dynamics and particle tracking
4. Rheological properties of droplets and bubbles
5. Advances of quantum computing in fluid dynamics
6. Studies of rarefied flows
7. Vortex dynamics and structure formation