Abstract Submitted
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Lagrangian structures in fluid turbulence damped by the addition of particles[1] YOICHI MITO, Kitami Institute of Technology — Lagrangian structures in turbulent gas flow being damped by the addition of a small amount of solid particles have been examined using a direct numerical simulation to calculate the gas velocities seen by particles and a point force method to calculate the forces exerted by particles on the gas. A simplified non-stationary flow model in which a uniform distribution of spherical particles are added into fully-developed turbulent gas flow through a vertical channel is considered. The Lagrangian autocorrelations of gas velocity fluctuations and of those seen by solid particles are calculated by setting point sources of fluid particles and of solid particles that do not exert forces on the gas at several distances from the wall and at several times after the addition of the solid particles that exert forces on the gas. Increases in the Lagrangian time scales for the gas velocity fluctuations and for those seen by solid particles with time, that is, with the decreases in gas turbulence are seen in the center region. The opposite tendency is seen for the Lagrangian time scales in the buffer region although the changes are small.

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Yoichi Mito
Kitami Institute of Technology

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