

Abstract Submitted
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A new timescale for turbulence modulation by particles¹ IZUMI SAITO, TAKESHI WATANABE, TOSHIYUKI GOTOH, Nagoya Institute of Technology — A new timescale for turbulence modulation by particles is introduced. This timescale is inversely proportional to the number density and the radius of particles and can be regarded as a counterpart of the phase relaxation time, an important timescale in cloud physics, which characterizes the interaction between turbulence and cloud droplets by condensation-evaporation. Scaling analysis and direct numerical simulations of dilute inertial particles in homogeneous isotropic turbulence suggest that turbulence modulation by particles can be expressed as a function of the mass-loading parameter and the Damkohler number, which is defined as the ratio of the turbulence large-eddy turnover time to the new timescale.

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