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Particle-Generated Isotropic Turbulence in the Final-Decay Period KYUNGJIN LEE, G.M. FAETH, University of Michigan, J.-H. CHEN, National Cheng Kung University — Isotropic turbulence generated by uniform fluxes of mono- and poly-disperse particle moving through gases was studied theoretically and experimentally. Measurements involved mean and rms fluctuating velocities, velocity PDF's, energy spectra, and integral and Taylor length scales. Particle-generated turbulence proved to be isotropic turbulence in the final-decay period that had several unusual features compared to conventional isotropic turbulence in the initial-decay period: rates of dissipation of turbulence kinetic energy were enhanced, ratios of integral/Taylor length scales were unusually large, and ratios of integral/Taylor length scales decreased with increasing turbulence Reynolds number, which is just opposite to conventional isotropic turbulence in the initial-decay period. Finally, the properties of the energy spectra of isotropic turbulence in the final-decay period yielded an effective correlation between the rates of turbulence production by the stirring action of the dispersed particles and the relative turbulence intensities of the particle-generated turbulence.

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