

Abstract Submitted
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Acceleration, enstrophy and dissipation in isotropic turbulence

CHANGHOON LEE, JAEDAL JEONG, KYONGMIN YEO, Yonsei University, Korea — Recent studies showed that fluid particle acceleration in turbulence is quite an intermittent variable. Source of the intermittency was found to be closely related to the rotational motion of coherent vortical structures. However, local dissipation in part contributes to the intermittency of acceleration. In order to clearly understand the relation between acceleration, local dissipation and local enstrophy which represents rotational components of the velocity strain tensors, we use a decomposition of acceleration into a^Ω and a^ϵ which are contributions from the rotational motion of eddies and irrotational straining motion, respectively. Statistics of each components of acceleration and cross correlation between them are investigated by using direct numerical simulation of isotropic turbulence. The flow is forced by large-scale forcing, thus hardly influencing directly the small-scale motion. Classical Kolmogorov scaling relation for accelerations are also checked for each component. Detailed statistics will be presented in the meeting.

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