Abstract Submitted
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Intermittency of Incompressible Passive Vector Convected by Homogeneous Turbulence[1] TOSHIYUKI GOTOH, JINGYUAN YANG, Nagoya Institute of Technology, HIDEAKI MIURA, National Institute for Fusion Science, TAKESHI WATANABE, Nagoya Institute of Technology — It is known that the fluctuation of passive scalar convected by turbulence is stronger than that of the turbulent velocity. In order to understand the physical mechanism yielding this difference we have studied the fluctuations of an incompressible passive vector $\boldsymbol{w}$ convected by the isotropic turbulence by comparing them with the passive scalar. It is found that the passive vector spectrum obeys the Obukhov-Corrsin spectrum $k^{-5/3}$ with constant $C = 0.99$ and the low order statistics is close to the velocity at large scales and resembles the passive scalar at small scales. Strength of the intermittency of the passive scalar is intemediate between the velocity and the passive scalar. The domain shape of intense $|\nabla \times \boldsymbol{w}|^2$ is found to be sheet like and similar to the scalar gradient. It is argued that the linearity of the equation is the key to generate the stronger intermittency of the passive fields.

[1]MEXT Kakenhi 15H02218, JSPS Kakenhi 17K05734, 18K03925, NIFS 18KNSS105, HPCI hp190043, JHPCN jh190018, JAMSTEC

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