

Abstract Submitted
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Test of the anomalous scaling of passive temperature fluctuations in turbulent thermal convection¹ PENGGER TONG, Department of Physics, Hong Kong University of Science and Technology, XIAOZHOU HE, Max Planck Institute for Dynamics and Self Organization, D-37073 Gottingen, Germany, XI-AODONG SHANG, South China Sea Institute of Oceanology, Chinese Academy of Sciences — The scaling properties of the temperature structure function (SF) and temperature-velocity cross-structure function (CSF) are investigated in turbulent Rayleigh-Benard convection. The measured SFs and CSFs are found to exhibit good scaling in space and time and a good agreement between the CSF exponents and the thermal dissipation exponents is observed, confirming that the anomalous scaling of passive temperature fluctuations in turbulent convection is indeed caused by the spatial intermittency of the dissipation field. Furthermore, the experiment demonstrates that the functional form of the SF and CSF exponents changes with the geometry of the most dissipative structures in the flow.

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