

Abstract Submitted
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Measured spatial distribution of the local thermal dissipation rate in turbulent Rayleigh-Bénard convection PENGER TONG, Department of Physics, Hong Kong University of Science and Technology*, XIAOZHOU HE, Department of Physics, Hong Kong University of Science and Technology, KEQING XIA, Department of Physics, the Chinese University of Hong Kong* — The time-averaged local thermal dissipation rate $\epsilon_N(\mathbf{r})$ in turbulent convection is obtained from simultaneous measurements of three components of the temperature gradient vector in convection cells filled with water. It is found that the measured $\epsilon_N(\mathbf{r})$ contains two contributions; one is generated by thermal plumes and occupies mainly in the plume-dominated bulk region. The other contribution comes from the mean temperature gradient and is concentrated in the thermal boundary layers. The experiment provides new insights into the mechanism of heat transport in turbulent convection.

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