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Joint multifractal analysis of intermittent fields in high-resolution DNS of turbulence<sup>1</sup> TAKASHI ISHIHARA, HIROTAKA HIGUCHI, Department of Computational Science and Engineering, Nagoya University — In high-Reynolds number turbulence, several intermittent fields coexist, among which are the rate  $\varepsilon$  of dissipation of turbulent energy, vorticity  $\omega$  and pressure gradients gradp, etc. These intermittent fields display different degrees of correlation among them. To characterize such coexisting distributions of intermittent fields in high-Reynolds number turbulence, we apply joint multifractal analysis to the data obtained by high-resolution DNS of turbulence in a periodic box. The analysis shows that the degree of correlation between  $\alpha_{\varepsilon}$  and  $\alpha_P$  is considerably high, but lower than between  $\alpha_{\varepsilon}$  and  $\alpha_{\Omega}$ , where  $P = |\text{grad}p|^2$  and  $\Omega = \omega^2/2$ , and  $\alpha_A$  is a local singularity strength of A.

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