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An argument against non-universal scaling coefficients for inertial range structure functions MOGENS MELANDER, SMU — In the inertial range of homogeneous isotropic turbulence with large scale forcing, the structure functions are statistical moments that depend parametrically on a length scale l. For each moment the scaling dependence with respect to l takes the form of a power law characterized by an exponent, a coefficient, and a virtual origin. The scaling exponent is generally believed to be a universal function of the order p of the moment. In contrast, the coefficient is not believed to be a universal function of p. Only when p is three or zero are universal values of the coefficient accepted. For other values of p one finds arguments in the literature that the coefficients can't be universal. These arguments build on the fact that the large scales are governed by the forcing which is essentially arbitrary. Supposedly, universal coefficients are in conflict with arbitrariness at the large scales, or so the argument goes. By a counterexample we show that there need not be any such conflict. Hopefully, this will clear the way for the idea of universal scaling coefficients for the inertial range.

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