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**Parametric Dependence of Homogeneous Turbulent Shear Flow on Reynolds Number and Shear Parameter** JUAN ISAZA, Cornell University, T. VAITHIANATHAN, LANCE COLLINS, Cornell University — The combined role of the Shear Parameter,  $S^* = Sk/\epsilon$ , and the Reynolds number in homogeneous turbulent shear flow is studied using direct numerical simulations (DNS). The parametric investigation involves DNS of  $256^3$ ,  $512^3$  and  $1024^3$  with a constant shear parameter,  $S^*$ , between 1 and 100. Particular attention is given to velocity derivatives (strain and rotation) and higher-order structure functions and their scaling with the two parameters. This study is in line with some recent results reported by Schumacher, [Phys. Fluids 16, 2004]. Due to the high level of shear investigated, a new algorithm that avoids the remeshing step is used. The 20% - 40% loss in kinetic energy and dissipation rate reported by Lee *et al.* [JFM, 216, 1990] using the Rogallo code is consequently avoided.

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