Abstract Submitted
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Statistics of SGS stress states in homogeneous isotropic turbulence[1] SERGEI CHUMAKOV, LANL — Two parameters are introduced that uniquely characterize the state of a third order symmetric tensor. We show that the proposed parameters are induced by the uniform metric in the matrix space, thus the joint PDF of these parameters can be used to determine the geometrical statistics of any third order symmetric tensor. We use the joint PDF of these parameters to describe the states of the subgrid-scale stress, which is of central interest in Large Eddy Simulation. Direct numerical simulation of forced isotropic turbulence is used in our *a priori* tests. With the proposed parameterization we can assess the most probable flow configuration on the scales of motion just above Kolmogorov scale. We also test four different subgrid-scale models on the subject of how well do they predict the structure, or state, of the subgrid-scale stress. It is found that models based on truncated Taylor series do not produce adequate distribution of state, even if augmented by turbulent viscosity term. On the other hand, models based on the scale-similarity assumption predict the distribution of states that is close to the actual.

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Sergei Chumakov
Los Alamos National Laboratory

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