

Abstract Submitted
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Analytical study on the SGS force around an elliptic Burgers vortex¹ HIROMICHI KOBAYASHI, Keio Univ — The subgrid-scale (SGS) force around an elliptic Burgers vortex is analytically examined. In turbulence, there are a lot of vortex-tubes whose cross sections are known to be approximated as the ellipse. In this study, the biaxial elliptic Burgers vortex is produced by adding the compressive and extensional background straining flow to the conventional Burgers vortex. By using a filtering operation, we revealed that the energy transfer by the Reynolds stress term applying the Bardina model exhibits negative correlation to that by the true SGS stress term. However, it has been recently reported that a combination of the Bardina Reynolds term and the eddy viscosity model gives good performance even for the coarse LES of turbulent channel flows. In order to understand that, we discuss some SGS forces: by the true SGS stress tensor, by the eddy viscosity model, by the modified Leonard term and by the Bardina Reynolds term.

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