"Energy transfers for LES of MHD turbulence: implication for realistic simulations of the Sun"

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The goal of the Stanford Solar Observatories Group is to study the origin of solar variability, characterize and understand the Sun's interior and the various components of magnetic activity. To achieve this goal, data analysis is performed from space missions. For a better understanding of the Sun and predictive capabilities for solar activity and space weather, these observations have to be accompanied by realistic numerical simulations of the subsurface flows and magnetic structures of the Sun. These simulations are extremely important for understanding the complicated physics of the upper turbulent convective boundary layer of the Sun, and magnetic field generation and dynamics. The primary objective of the Stanford-France project is to develop realistic models of the solar turbulence. This work will be based on analysis of a database of explicit numerical simulations of academic turbulent flows, developed by the group of Professor Balarac at Laboratoire des Ecoulements Géophysiques et Industriels, Université de Grenoble, and on the solar modeling project, led by Dr Kosovichev at Stanford. The results will substantially contribute to our understanding of complicated turbulent phenomena on the Sun, and mechanisms of solar eruptions.