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Subgrid-scale modeling of large eddy simulation for compressible magnetohydrodynamic turbulence.

A. A. Chernyshov (1), K. V. Karelsky (1), **A. S. Petrosyan** (1)

(1) Space Research Institute of the Russian Academy of Sciences, Moscow. (apetrosy@iki.rssi.ru)

The numerical large eddy simulation (LES) technique for system of magnetohydrodynamic compressible fluid equations is developed. Favre-filtered resolved equations of compressible magnetohydrodynamics contain both new subgrid-scale terms and combinations of already well-known terms, which are resulted from models of compressible neutral gas and models of incompressible magnetic fluid. Parameterizations of subgrid-scale terms are proposed. The parameterizations are tested by comparing the obtained results to a high-resolution direct numerical simulation (DNS) of three-dimensional compressible magnetohydrodynamic turbulence.