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Scaling criteria for high Reynolds number MHD turbulence[1] YE ZHOU, Lawrence Livermore National Laboratory, Livermore, CA, 94551 — Magnetohydrodynamic (MHD) turbulence has been employed as a physical model for a wide range of applications in astrophysical and space plasma physics. This paper addresses the following questions. At what MHD flow condition can investigators be sure that their numerical simulations have reproduced all of the most influential physics of the flows and fields of practical interest? Another question, perhaps more specific, is can one define a metric to indicate whether the necessary physics of the flows of interest have been captured and suitably resolved using the tools available to the researcher? This issue was previously addressed in the context of high energy density physics where the Reynolds number of the minimum state was determined to be 1.6×10^5 [Zhou, Phys. Plasma, 14, 082701 (2007)]. The current paper focuses on extending the threshold minimum state criteria to include the correspondingly high Magnetic Reynolds number influences in MHD applications.

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