Abstract Submitted
for the DFD12 Meeting of
The American Physical Society

Invariant turbulence models ALEXANDER BIHLO, Centre de recherches mathématiques, Université de Montréal, ELSA MARIA DOS SANTOS CARDOSO-BIHLO, Faculty of Mathematics, University of Vienna, JEAN-CHRISTOPHE NAVE, Department of Mathematics and Statistics, McGill University, ROMAN POPOVYCH, Institute of Mathematics of NAS of Ukraine — Various subgrid-scale closure models break the invariance of the Euler or Navier–Stokes equations and thus violate the geometric structure of these equations. A method is shown which allows one to systematically derive invariant turbulence models starting from non-invariant turbulence models and thus to correct artificial symmetry-breaking. The method is illustrated by finding invariant hyperdiffusion schemes to be applied in the two-dimensional turbulence problem.

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Date submitted: 02 Aug 2012 Electronic form version 1.4