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Evidence for Small Scale Grid-Induced Anisotropy JAMISON L. SZWALEK, WERNER J.A. DAHM, University of Michigan — In the last 25 years, several studies have presented evidence for the persistence of anisotropy at scales for which the assumption of local isotropy would be expected to hold. We report results of an investigation into the approach to isotropy on a scale-by-scale basis from analysis of DNS data. We quantify the level of anisotropy at each length scale by investigating both its magnitude and directional preference in Fourier space. Results show clear evidence of strong anisotropy introduced at the grid scale by the directional characteristics of the differencing scheme. This grid induced anisotropy is found to propagate to intermediate scales, leaving no scale region unaffected by the numerical method. The present results demonstrate the limits of DNS data based on traditional differencing schemes for studies of small-scale anisotropy.

Jamison Szwalek
University of Michigan

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