

Abstract Submitted
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Detrended analysis of Reynolds stress in a decaying turbulent flow in a wind tunnel with active grids ZHIMING LU, IMTIAZ AHMAD, YONGXIANG HUANG, Shanghai Institute of Applied mathematics and Mechanics, Shanghai University — Multi-scale properties of Reynolds stress in decaying turbulence at a wind tunnel with high Reynolds number are investigated. Two filtering technique i.e., zeroth-order and first-order detrending method are applied to the two velocity components, where the local mean value (resp. local linear trend) is removed in the former (latter) technique. Some basic statistics for thirty measurements show that the variation is very large at first two locations and relatively small at last two locations. Moderately good power law is found for the mean value of local Reynolds stress at last three measurement locations with scaling exponents approximately being 1.0 and a dual power law exists for the mean value of standard deviation of local Reynolds stress at all four measurement locations with scaling exponents being 0.53 and 0.58 for zeroth- and first-order filtering respectively.

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