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Identifying turbulent coherent structures during LLJ events VELAYUDHAN PRAJU KILIYANPILAKKIL, North Carolina State University, Raleigh, NC, GUILLERMO ARAYA, Texas Tech University, Lubbock, TX, SUKANTA BASU, North Carolina State University, Raleigh, NC, ARQUIMEDES RUIZ-COLUMBIÉ, WALTER GUTIERREZ, LUCIANO CASTILLO, Texas Tech University, Lubbock, TX, TEXAS TECH UNIVERSITY TEAM, NORTH CAROLINA STATE UNIVERSITY TEAM — Turbulent structures in the unstable atmospheric boundary layer have been extensively studied in the past. However our recent research show that the state-of-the art Weather Research & Forecasting model (WRF) model needs improvement in the simulation of nocturnal low level jet (LLJ) characteristics. Under these scenarios, the nocturnal stable boundary layer offers some gray areas to explore, particularly when conditions of high stability and strong vertical wind shear occur. Furthermore, the interactions of nighttime intermittent turbulence (high frequency) with coherent structures play an essential role in transport processes. In the present study, using wavelet analysis techniques, the WRF large-eddy simulation data are evaluated for coherent structure features during LLJ occurrences over the West Texas region. Those structural attributes will be compared to those observed by the high frequency (50 Hz) of the 200-meter meteorological tower (Reese, West Texas Mesonet). Additionally, the meteorological tower data are used to evaluate the influence of data acquisition frequency on small turbulent scale detection.

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