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Characterization of low-drag events at a moderate Reynolds number of $Re_\tau = 700$[1] ETHAN DAVIS, University of Nebraska - Lincoln, ANCHAL SAREEN, University of Minnesota, SIAMAK MIRFENDERESKI, University of Nebraska - Lincoln, ELLEN LONGMIRE, University of Minnesota, JAE SUNG PARK, University of Nebraska - Lincoln — Low-drag events are intriguing, intermittent events in wall-bounded turbulent flows that are a natural target for flow control strategies. Sometimes referred to as hibernating turbulence, these events are described by extended periods (~ 3 eddy turnover times) where the skin friction of the system is considerably lower than its mean value ($\sim 90\%$ of the mean). Characterization of low-drag events can provide a better understanding of how and why these events manifest. While these events have been characterized in transitional and turbulent flows up to $Re_\tau \sim 100$, we extend the analysis to higher Reynolds numbers. In this talk, we discuss the characteristics of low-drag events at a moderate Reynolds number of $Re_\tau = 700$. We compare direct numerical simulations (DNS) of a turbulent channel flow with experimental data obtained by stereoscopic particle image velocimetry (SPIV) for a turbulent boundary layer at the same friction Reynolds number. Near-wall low-drag events are observed in both DNS and SPIV data, and flow characteristics of events found in each method are in good agreement. Turbulent statistics of low-drag events are also presented. Lastly, Reynolds number dependence of low-drag events is discussed.

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