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Scale by scale budgets for PIV and DNS data of wall-bounded turbulence N. MARATI, E. LONGMIRE, N. SAIKRISHNAN, I. MARUSIC, C.M. CASCIOLA, R. PIVA, University of Minnesota, Università di Roma "La Sapienza" — The dynamics of the wall region at different scales recently has been analyzed for DNS of a channel at small Reynolds number through a generalized form of the Kármán-Howarth equation. The present work analyzes the scale-by-scale dynamics of wall-bounded flows at higher Re using both experimental and numerical data. The former data are taken from a dual-plane PIV experiment (that allows evaluation of the entire velocity gradient tensor) performed in a zero-pressure-gradient turbulent boundary layer at friction Reynolds number $Re_\tau = 1160$. The numerical data are taken from DNS of a turbulent channel flow by Zandonade and Moser, realized at a comparable $Re_\tau = 950$. Wall-normal locations in the log and wake regions were analyzed. In the log region, both data sets show the existence of a large-scale production range, followed by a nearly classical transfer range, closed by diffusion at the local dissipative scales. In the wake region the turbulent fluctuations are sustained by the spatial flux of scale-energy, while the local production plays a minor role.

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