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**Properties of the advective transport contribution to the inertial mean dynamics of rough-wall boundary layers** RACHEL EBNER, University of New Hampshire, JOSEPH KLEWICKI, University of New Hampshire; University of Melbourne — Measurements and scaling analyses are conducted to clarify the combined effects of roughness and Reynolds number on momentum transport in rough-wall turbulent boundary layers. Experiments employing a four element ("Foss style") spanwise vorticity probe cover nearly a decade in Reynolds number, and nearly three decades in sand grain roughness, $k_s^+$. Here we leverage the expression that decomposes the Reynolds stress gradient into the difference of two velocity-vorticity correlations, i.e., $-\partial\overline{uv}/\partial y = \overline{v\omega_z} - \overline{w\omega_y}$. The present analyses focus on the first term on the left hand side, $v\omega_z$, in the logarithmic layer and outer regions, as it is known from smooth-wall studies that this advective transport mechanism is the largest contributor to $-\partial\overline{uv}/\partial y$ in the domain where the mean dynamics are inertially dominated. Streamwise correlation maps and length scales associated with the spectra and correlations of $v$ and $\omega_z$ are used to clarify the scaling behaviors of the motions underlying $-\partial\overline{uv}/\partial y$. The results are shown to further support the combined roughness Reynolds number description of Mehdi et al. 2013, *J. Fluid Mech.* **731**, 682

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