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**The spectral link in mean-velocity profile of turbulent plane-Couette flows** DONGRONG ZHANG, GUSTAVO GIOIA, PINAKI CHAKRABORTY, Okinawa Institute of Science and Technology — In turbulent pipe and plane-Couette flows, the mean-velocity profile (MVP) represents the distribution of local mean (i.e., time-averaged) velocity on the cross section of a flow. The spectral theory of MVP in pipe flows (Gioia *et al.*, PRL, 2010) furnishes a long-surmised link between the MVP and turbulent energy spectrum. This missing spectral link enables new physical insights into an imperfectly understood phenomenon (the MVP) by building on the well-known structure of the energy spectrum. Here we extend this theory to plane-Couette flows. Similar to pipe flows, our analysis allows us to express the MVP as a functional of the spectrum, and to relate each feature of the MVP relates to a specific spectral range: the buffer layer to the dissipative range, the log layer to the inertial range, and the wake (or the lack thereof) to the energetic range. We contrast pipe and plane-Couette flows in light of the theory.

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