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**Exact near-wall traveling waves of plane Poiseuille flow** JOHN GIBSON, EVAN BRAND, University of New Hampshire — We present several spatially-localized equilibrium and traveling-wave solutions of plane Couette and plane Poiseuille flow. The solutions consist of highly concentrated and spanwise-localized alternating streamwise rolls, centered over low-speed streamwise streaks and flanked on either side by high-speed streaks. For large Reynolds numbers the solutions develop critical layers that are concentrated at isolated points on the critical surface $u = c$. For several traveling-wave solutions of plane Poiseuille flow, the rolls are concentrated near one wall, producing streaks near the wall and larger reduction of the bulk flow in the core. These solutions form particularly isolated and elemental versions of near-wall coherent structures in shear flows and capture, as precise time-independent solutions of Navier-Stokes, the process by which near-wall rolls exchange momentum between the wall and core regions and thereby increase drag.

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