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Spatially localized solutions and homoclinic snaking in plane Couette flow JOHN GIBSON, Georgia Institute of Technology, TOBIAS SCHNEIDER, Harvard University, JOHN BURKE, Boston University — We examine a new class of spatially localized solutions to plane Couette flow, first discovered by Schneider, Marinc, and Eckhardt. Under continuation in Reynolds number the equilibrium and traveling-wave solutions exhibit a sequence of saddle-node bifurcations strikingly similar to the "homoclinic snaking" phenomenon observed in simpler PDE systems such as the Swift-Hohenberg equation. These localized solutions originate from bifurcations off the spatially periodic equilibria discovered by Nagata and others and retain their physical structure, demonstrating the relevance of exact periodic solutions to turbulent flows in spatially extended domains.

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