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New Exact Coherent States in Channel Flow MASATO NAGATA, Tianjin University, DARREN WALL, Nippon Bunri University — Three spatially periodic traveling wave exact coherent states in channel flow are presented. Two of the flows are derived by homotopy from solutions for channel flow subject to a span-wise rotation investigated by Wall & Nagata (2013). Both these flows are asymmetric with respect to the channel center-plane, and feature streaky structures in stream-wise velocity franked by staggered vortical structures. One of these flows features two streak/vortex systems per span-wise wavelength, while the other features one such system. The third flow satisfies a half-turn rotational symmetry about a point on the channel center-plane, and turns out to be the flow from which one of the asymmetric flows bifurcates in a symmetry breaking bifurcation. One of the asymmetric flows is found to substantially reduce the value of the lowest Reynolds number at which exact solutions are known to exist down to 665.

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