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**Numerical Simulations of Curvature Effects in Laminar Channel Flows** SANDRA S. SOWAH, MICHAEL E. MUELLER, HOWARD A. STONE, Princeton University — Numerical simulations of curvature effects in laminar channel flows are performed by introducing body force terms into the Navier-Stokes equations, which are written in Cartesian coordinates. The advantage of introducing body force terms within a Cartesian framework, compared to performing simulations in native cylindrical coordinates, is the ability to easily transition from straight to curved regions of a channel flow. Using this approach, the onset of Dean vortices for laminar flow is investigated for varying Reynolds numbers and ratios of radius of curvature to channel height. The results are verified against simulations in cylindrical coordinates.

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