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Transport control for apolar active suspension in a rectangular channel using circular cylinders SHENG CHEN, TONG GAO, MICHIGAN STATE UNIVERSITY, COMPLEX FLUIDS GROUP AT MSU TEAM — We study the control for transport of a dilute apolar active suspension in a rectangular channel using circular cylinders. We adopt a coarse-grained active liquid crystal model to describe collective unstable dynamics of non-motile but mobile rod-like particles, i.e., the "Extensors", in Stokes flows. By using a Galerkin mixed finite element method, we previously revealed various patterns of spontaneous coherent flows that can be unidirectional, traveling-wave, and chaotic for the case without cylinders inside. To uncover the transport control using circular cylinders, we first study how fixed cylinders change the flow transitions in channel by systematically changing the cylinder size, separation distance, and the channel width. We further study if the flow transitions alter when the cylinders are free to rotate about a fixed axis.

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