

Abstract Submitted
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Hydrodynamic interactions of cilia on a spherical body BABAK NASOURI, GWYNN J. ELFRING, The University of British Columbia, Vancouver — The emergence of metachronal waves in ciliated microorganisms can arise solely from the hydrodynamic interactions between the cilia. For a chain of cilia attached to a flat ciliate, it was observed that fluid forces can lead the system to form a metachronal wave. However, several microorganisms such as paramecium and volvox possess a curved shaped ciliate body. To understand the effect of this geometry on the formation of metachronal waves, we evaluate the hydrodynamic interactions of cilia near a large spherical body. Using a minimal model, we show that for a chain of cilia around the sphere, the embedded periodicity in the geometry leads the system to synchronize. We also report an emergent wave-like behavior when an asymmetry is introduced to the system.

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