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Linear Stability for Models of Active Suspensions CHRISTEL HOHENEGGER, MICHAEL SHELLEY, Courant Institute New York University — Recent work by Saintillan & Shelley has modeled the dynamics of active suspensions, such as swirling bacterial baths, through a modification of Doi rod theory. However, the sign of the dipolar extra stress can be of the opposite sign of Doi theory, and this leads to large-scale flow instability. We investigate the structure of this system linearized near a state of isotropy and uniformity. We show that concentration fluctuations generally decay, and that while long-wave instability depends upon the particular swimming mechanism, short-wave stability does not. This suggests that the model is well-posed, even in the absence of translational and rotational diffffusion effffects.

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