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Parametric Studies of Swimming Filaments at Low Reynolds Numbers TRISTAN SPOOR, STEPHAN KOEHLER, ERIC WILLISSON, Worcester Polytechnic Institute — Swimming of microorganisms in viscous fluids is a complex problem involving many degrees of freedom. In order to gain insight on this problem we investigate a simple model for locomotion of a thin, finite-length undulating filament. By keeping the number of parameters minimal we are able to compare similarities for four waveforms; two different sinusoidal (Cartesian and curvature), sawtooth, and square strategies. Beyond the domain of straight motion a number of turning strategies are also considered. These strategies are evaluated and in the case of the straight swimmers, although the differences between the strategies in terms of greatest speed are substantial, the differences in terms of greatest efficiency are small.

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