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Prey-Induced Swimming Dynamics Changes among Predatory Algae J. KATZ, J. SHENG, E. MALKIEL, Johns Hopkins Univ., J. ADOLF, A. PLACE, R. BELAS, UMBI — High speed, cinematic digital holographic microscopy allows us to track thousands of microorganisms over a volume with substantial depth without loss of resolution. This technique enables us, for the first time, to examine, measure and characterize the swimming dynamics of microorganisms located within dense suspensions. The present experiments examine dense populations of predatory algae, *K. veneficum* and *P. piscicida*, prior to and after introducing prey. Swimming dynamics are characterized by radius and pitch of helical swimming trajectories, by translational and angular velocity, and their velocity spectra. *K. veneficum* moves in both left and right hand helices, while *P. piscicida* swims only in right hand helices. The radii increase with increasing velocity for both cases. Presented with its prey, *K. veneficum* reduces its velocity, radius and pitch, but increases its angular velocity. Conversely, *P. piscicida* increases its speed, radius and angular velocity. Power spectra of velocity reveal differences between scales of vertical velocity and those of horizontal components. Power spectra of velocity component aligned with the helix centerline reveals a shift in *K. veneficum's* swimming strategy from almost random-walk to a levy-walk as prey is introduced. *P. piscicida* always displays clear preference towards levy-walk, but spectral slope increases as prey is introduced.

Jian Sheng
Univ. of Kentucky

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