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Motility of small nematodes in disordered wet granular media GABRIEL JUAREZ, KEVIN LU, JOSUE SZNITMAN, PAULO E. ARRATIA, University of Pennsylvania — Organisms that evolve within complex fluidic environments often develop unique methods of locomotion that allow them to exploit the properties of the media. In this talk, we present an investigation on the motility of the worm nematode *Caenorhabditis elegans* in shallow, wet granular media as a function of particle size dispersity and area density (ϕ) using both particle- and nematode-tracking methods. Surprisingly, the nematode's propulsion speed is enhanced by the presence of particles in a fluid and is nearly independent of local area density. The undulation speed, often used to differentiate locomotion gaits, is significantly affected by particle size dispersity for area densities above $\phi > 0.55$, and is characterized by a change in the nematode's waveform from swimming to crawling. This change occurs for dense polydisperse media *only* and highlights the organism's adaptability to subtle differences in local structure between monodisperse and polydisperse media.

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