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**On the dynamics of jellyfish locomotion via 3D particle tracking velocimetry.** MATTHEW PIPER, JIN-TAE KIM, LEONARDO P. CHAMORRO, University of Illinois at Urbana-Champaign — The dynamics of jellyfish (Aurelia aurita) locomotion is experimentally studied via 3D particle tracking velocimetry. 3D locations of the bell tip are tracked over 1.5 cycles to describe the jellyfish path. Multiple positions of the jellyfish bell margin are initially tracked in 2D from four independent planes and individually projected in 3D based on the jellyfish path and geometrical properties of the setup. A cubic spline interpolation and the exponentially weighted moving average are used to estimate derived quantities, including velocity and acceleration of the jellyfish locomotion. We will discuss distinctive features of the jellyfish 3D motion at various swimming phases, and will provide insight on the 3D contraction and relaxation in terms of the locomotion, the steadiness of the bell margin eccentricity, and local Reynolds number based on the instantaneous mean diameter of the bell.

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