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Dynamics of tethered versus free-swimming animals: A wake structure comparison in jellyfish KAKANI KATIJA, JOHN O. DABIRI, Graduate Aeronautical Laboratories (GALCIT) and Bioengineering, California Institute of Technology — Previous research has shown that jellyfish utilize the formation and shedding of vortices to help feed and move the animal. Laboratory experiments often require restricting the motion of an animal by tethering/fluming to allow for repeatable results. However, past research has not addressed the differences that arise when the motion of an animal is restricted/confined. This presentation will attend to this issue by comparing the wake structure of a tethered and free-swimming *Aurelia aurita*. Digital Particle Image Velocimetry is used to collect measurements of the velocity field surrounding an animal that is either tethered or swimming freely. Dynamical systems methods are used to compute Lagrangian coherent structures (LCS), which is used to identify the geometries of structures in the wake of the animal. Using LCS, a comparison between the wake of a tethered and free-swimming animal can be made. This research provides a quantitative measure of the differences between a tethered and freely moving jellyfish.

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