

Abstract Submitted  
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**Instantaneous Global Separation on a Vanishing Wing** DAVID RIVAL, MARTIN WIBAWA, MICHAEL TRIANTAFYLLOU, MIT — Inspired by Taylor’s analytical treatment of an impulsively-accelerated, vanishing circular disk,<sup>1</sup> the authors have examined the transfer of circulation from a vanishing wing’s hypothetical bound vortex into the wake. The study was performed experimentally in a water towing tank by rapidly removing a moving wing at incidence. By applying lead-precipitate and PIV techniques, the transfer of circulation from the two boundary layers into a vortex pair in the wake could be observed. By tracking the strength of these two shed vortices, it was found that the net circulation transferred into the wake was equal in strength to that of the bound vortex. However, contrary to standard vorticity transfer from a stalled foil, the time scales associated with this transfer process are found to be much more rapid in nature. This opens up new possibilities for biomimetic propulsion mechanisms based on this concept of rapid area change.

<sup>1</sup>G. I. Taylor, “Formation of a Vortex Ring by Giving an Impulse to a Circular Disk and then Dissolving it Away,” *J. Applied Physics* **24**, 104 (1953)

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