

Abstract Submitted  
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**Computational analysis of wake structure and body forces on marine animal research tag** MATTHEW ROSANIO, Syracuse University, JACOB MORRIDA<sup>1</sup>, University of Notre Dame, MELISSA GREEN, Syracuse University — The Acousonde 3B marine animal research tag is used to study the relationship between the sounds made by whales and their behaviors, and ultimately to improve whale conservation efforts. In practical implementation, some researchers have attached external GPS Fastloc devices to the top surface of the tag, in order to accurately record the position of the whales throughout the deployment. There is a need to characterize the flow over the tag in order to better understand the body forces being exerted on it and how wake turbulence could affect noise measurements. The addition of the GPS Fastloc exacerbates both of these concerns, as it complicates the hydrodynamics of the device. Using CFD techniques, we were able to simulate the flow over the tag with a GPS attachment at multiple yaw angles. We used Pointwise to construct the mesh and Fluent to simulate the flow. We have also used flow visualization to experimentally validate our computational results. It was found that the GPS has a minimal effect on the wake of the tag at a 0 degree offset from the freestream flow. However, at increasing offset angles, the presence of the GPS greatly increased the amount of wake turbulence observed.

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