Abstract Submitted
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2D CFD Airfoil Analysis GRACE BABB, University of Alabama at Hunstville — This work aims to produce a higher fidelity model of the blades for NASA's X-57 all electric propeller driven experimental aircraft. This model will, in turn, allow for more accurate calculations of the thrust each propeller can generate. This work uses computational fluid dynamics (CFD) to first analyze the propeller blades as a series of 11 differently shaped airfoils and calculate, among other things, the coefficients for lift and drag associated with each airfoil at different angles of attack. OpenFOAM—a C++ library that can be used to create series of applications for pre-processing, solving, and post-processing—is one of the primary tools utilized in these calculations. By comparing the data OpenFOAM generates about the NACA 23012 airfoil with existing experimental data about the NACA 23012 airfoil, the reliability of our model is measured and verified. A trustworthy model can then be used to generate more data and sent to NASA to aid in the design of the actual aircraft.

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