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REPORT ON

CFD ANALYSIS OF DRONE THRUST WITH DUCT

A Project report submitted for the partial fulfilment of the requirements for award of Degree of

BACHELOR OF TECHNOLOGY
IN
MECHANICAL ENGINEERING

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CERTIFICATE

This is to certify that the project entitled "**CFD Analysis of drone thrust with duct**" is the record of the work carried out by **Indala Jagadeesh(18815A0320), Vodugonda Mouli(18815A0370), Adari Gurudatta Ramana Sai Kumar(18815A0319), Jalumuri Sai(18815A0321)** students of final year B. Tech in the department of Mechanical engineering. This work is done for the partial fulfilment for the award of BACHELOR OF TECHNOLOGY during the year 2020-2021.

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ABSTRACT

Drone propellers are rotating wings producinglift in the direction of the axis of rotation. Propeller bladedesign is critical to generate enough thrust to carry thetakeoff weight and reduce noise level. In thisproject, numerical analysis is conducted for theaerodynamics performance of two propeller designs at thestatic thrust condition. The first design is based on theDJI Spark drone propeller blade and the seconddesign add a winglet to the first design. 3D CAD modelswere created in SOLIDWORKS and were imported toSimScale, a cloud-based software, for the computationalfluid dynamics (CFD) analysis. The winglet propeller wasfound to generate 21% more thrust than the originalpropeller without winglets. The flow patterns, includingpressure and velocity distributions were compared for bothmodels CFD results have found to follow similar trends with experimental results in terms of thrust coefficient. In addition, predictions of numerical analyses found to get closer to experimental results at lower airspeeds