Master's Thesis Defense Announcement

Mechanical and Aerospace Engineering Department

University of Texas at Arlington

ROTOR PERFORMANCE MODEL (RPM)

By

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Teams Link

Abstract

Rotorcraft performance modeling is of high interest with multiple industry codes in existence, many of which are high-fidelity and are comprehensive in the analyses that are achievable. Along with the high-fidelity and the comprehensive nature of the industry codes comes an equally high level of complexity in the inputs required to extract meaningful results. The ever-increasing fidelity in the existing codes creates a need for an analysis code that is built to be highly flexible and built from the bottom up, while being implemented from the top down. The Rotor Performance Model (RPM) was developed to provide high-fidelity performance analysis options without the cost of highly complex input parameters for the rotor. To date, the code was developed with the goal of being well documented, modular, and physics-based in order to provide the use of macroscopic rotor input parameters and the framework to build upon with future work – all without the need for a complete re-work of the code infrastructure. With the implementation of the dynamic inflow models of Pitt-Peters, and Peters et.al., combined with a hybrid periodic shooting/Newton-Raphson technique, the blade motion trim time and closure of the thrust/induced velocity has been accelerated in the current analysis program without the necessity of a wealth of rotor input data.