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Feasibility study of an axially stacked propeller

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With the aerospace industry pushing for an increased production and application of unmanned aerial vehicles (UAVs), humans will increasingly become exposed to noise pollution emanating from above Fortunately, electric motors have and will continue to gain an ever-prominent role in the power plant of small, to mid-sized air vehicles, thus reducing the levels of acoustic exposure due to aircraft. However, one consequence of this electric motor emphasis is that the noise generated from an electric motor-powered UAV may become dominated by the propeller's acoustics. In many cases, this propeller is selected off-the-shelf and only given consideration late in the design process. In an effort to reduce acoustic emission of future UAVs, this paper explores the design field of a unique multi-stage propeller configuration, which may be applied to a vehicle post-design.

Biography

Andrew Knesnik is a Mechanical Engineer with experience in the Aerospace Industry. He obtained his B.S. Mechanical Engineering degree at Cedarville University in 2011, which was quickly followed by an M.S. Mechanical Engineering degree at the University of Cincinnati in 2012.Knesnik is developing propeller analysis techniques for the Air Force Research Laboratory in order to reduce the computational expense of propeller acoustic simulation and continues to pursue research opportunities in this field.

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