

Passive Blade-Vortex Interaction Noise Reduction

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Technology Summary

The inventors have developed a novel way of reducing helicopter/rotorcraft noise or more specifically, blade-vortex interaction (BVI) noise. This concept involves integrating narrow resonator cavities inside of the rotor blades. Generally, current techniques of reducing BVI noise to the same degree as this novel method are limited as they can negatively affect the vehicle's performance, increase cabin vibrations, and increase the rotor system's complexity which incurs additional implementation and maintenance costs. For instance, it has been demonstrated that modifying the blade geometry can reduce BVI noise, however, this can also cause the blades to become prone to structural issues or aeroelastic instabilities. These shortcomings are circumvented with the inventor's novel BVI noise reduction strategy, since it is a passive concept that does not alter the overall blade geometry.

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Application & Market Utility

BVI noise is one of the most distinctive qualities of a helicopter's overall noise emissions and contributes significantly to community annoyance. It is typically generated in descending or maneuvering flight, which is when the vehicle tends to be near the ground. Due to their loud noise emissions, the operations of rotorcraft are already highly restricted in densely populated areas and there is constantly new legislation being proposed to further extend these restrictions. Therefore, reducing BVI noise would reduce community annoyance, which would promote public acceptance of these vehicles and in turn be profitable for the general aviation industry.

Next Steps

The research team is seeking licensing and investment opportunities.

TECHNOLOGY READINESS LEVEL

3

Seeking

Investment | Licensing |

Keywords

- Blade-Vortex Interaction
- Noise Emissions
- Aircraft

Researchers

Dr. Eric Greenwood

Assistant Professor of Aerospace Engineering

Daniel Weitsman

Graduate Student

Other Researchers

Originating College

College of Engineering

Office of Technology Management Contact

Robert Prosak
rbp5558@psu.edu