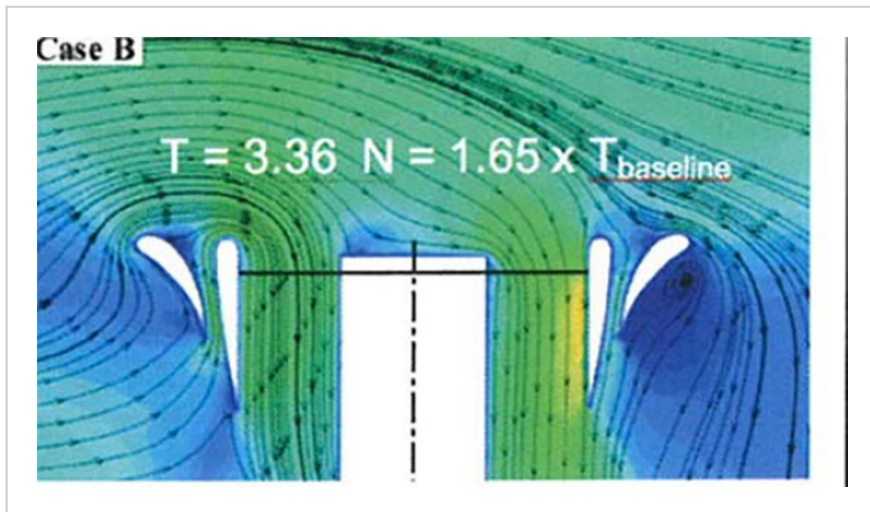


# Double Ducted Fan for Aerodynamic Improvements in Flight

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PennState



TECHNOLOGY READINESS LEVEL

4-7

## Seeking

Licensing |

## Keywords

- Vertical short takeoff and landing
- VSTL
- Unmanned aerial vehicles (UAVs)
- ducted fan design

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## Technology Summary

This new design of a novel ducted fan inlet flow significantly improves the performance and controllability of vertical short takeoff and landing (VSTL) Unmanned Aerial vehicles (UAVs) and other ducted fan based systems. The new design will significantly reduce inlet lip separation related performance penalties in the forward flight zone. The design employs a secondary station duct system. It is self-adjusting in a wide forward flight velocity range. The design can also be used in any axial fan flow system where there is a local zone where there are strong radial velocity components distorting the inlet flow, such as wind or airflow.

## Application & Market Utility

Numerous vertical short takeoff and landing (VSTL) Unmanned Aerial vehicles (UAVs) employ a ducted fan propulsion system. Inlet flow separation can be a significant problem where the inlet flow direction is misaligned with the rotational axis of the axial-flow fan system. This can lead to asymmetrical loading, resulting in increased power requirements for unaccelerated flight, vibratory loads and increased noise level. Fuel consumption can increase, and aerodynamical and control issues can result as well.

## Next Steps

Seeking licensing opportunities. Covered by U.S. Patent 8,821,123.



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