



Cornell University
College of Engineering Sibley School of Mechanical and Aerospace Engineering

Computational Science in Engineering

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BS Mechanical Engineering 2010

Minor in Aerospace Engineering



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Outline

- Background
- Undergraduate Curriculum
- Undergraduate Research
- Summer Internship
- Future Plans



Undergraduate Curriculum

- Foster interest
- Introduction to tools
- MAE 3272 (Mechanical Properties & Performance Lab)
- MAE 4270 (Fluids-Heat Transfer Lab)
- MAE 4700 (Finite Element Analysis)
- MAE 4230 (Intermediate Fluids)



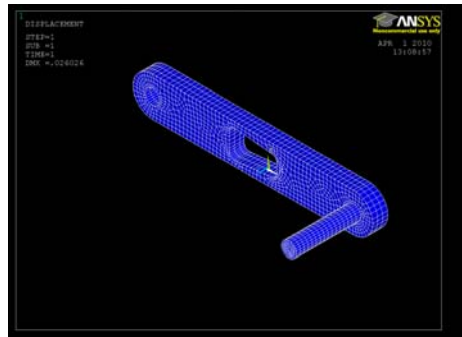
M&AE 3272 Mech. Property & Performance Lab

Bicycle Component Modeling and Testing

Experiment



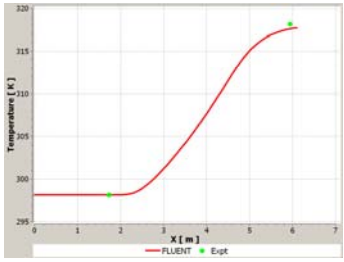
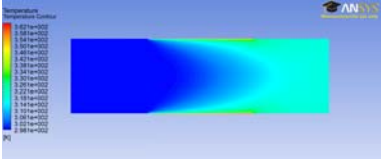

Simulation



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M&AE 4272 Fluids/Heat Transfer Lab

Experiment Simulation





X [m]	Temperature [K] (FLUENT)	Temperature [K] (Exp)
0	295	
1	295	
2	295	
3	295	
4	305	
5	315	
6	318	
6.5		318

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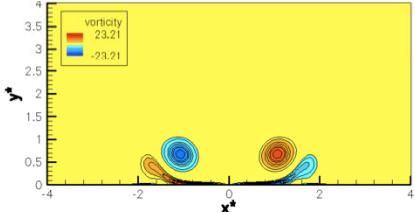
Undergraduate Research

Instabilities of Aircraft Wake Vortices in Ground Effect.

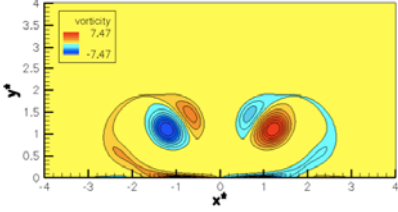



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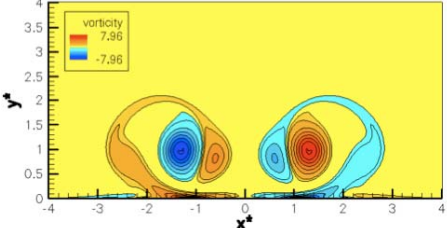
Undergraduate Research




• Interacting wing tip vortices descending on runway



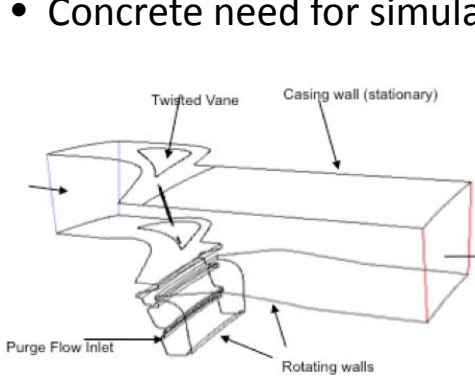
• Model Counter-rotating vortex pair



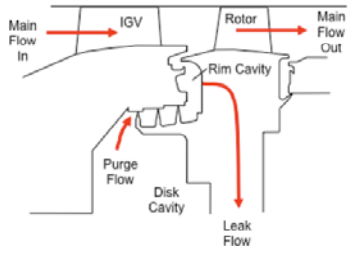

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Summer Internship: Pratt & Whitney

- Concrete need for simulation



Main Gas Path Flow Direction



- Difficulties in accurately modeling turbulent fluid mixing inside cavity
- Growing need for accurate and reliable prediction methods in complex aerospace systems.



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Future Plans

- Graduate School in Aerospace engineering
- Uncertainty Quantification
& Probabilistic Design at MIT
- Apply in Industry



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Thank you

Questions ?