

Resumes and Cover Letters

I have made this letter longer than usual because I lack the time to make it shorter.

Blaise Pascal

Name	
Home Address City, State, Zip Code URL: Web Address, if applicable	Work Address Phone Number Fax, if applicable
Objective To obtain a _____ position in the area of _____ (write the specific position to target the audience of the resume)	
Education Name of College or University, Expected Month Year (University) Overall GPA: X.XXX-4.00 Target GPA (if applicable): X.XXX-4.00 Name of Most Recent Degree, Month Year (if applicable) University or College Target GPA (if applicable): X.XXX-4.00 Overall GPA: X.XXX-4.00	
Relevant Courses Most Relevant Course Fourth Most Relevant Course Second Most Relevant Course Fifth Most Relevant Course Third Most Relevant Course Sixth Most Relevant Course	
Experience Most Recent Position, Company, Location Object's Year-Month-Year Very please describe key activity that you performed Second most please describe key activity that you performed Third most please describe key activity that you performed (if appropriate) Next Most Recent Position, Company, Location Object's Year-Month-Year Very please describe key activity that you performed Second most please describe key activity that you performed Third most please describe key activity that you performed (if appropriate) Third Most Recent Position, Company, Location Object's Year-Month-Year Very please describe key activity that you performed Second most please describe key activity that you performed Third most please describe key activity that you performed (if appropriate)	
Honors/Awards Most Impressive Honor or Award Second Most Impressive Honor or Award Third Most Impressive Honor or Award Fourth Most Impressive Honor or Award	
Activities Most Impressive Activity Second Most Impressive Activity Third Most Impressive Activity Fourth Most Impressive Activity	
Outside Interests One outside interest, a second outside interest, perhaps a third outside interest	



You should begin the writing process by analyzing your constraints

what do they know?
why are they reading?

what expectations do they have?
how will they read?

audience

purpose

to inform
to persuade

occasion

format
formality
deadline
process



Format is the arrangement of type on the page

typography

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HIGH FREESTREAM TURBULENCE EFFECTS ON ENDWALL HEAT TRANSFER
FOR A GAS TURBINE STATOR VANE

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ABSTRACT

High freestream turbulence along a gas turbine airfoil and strong secondary flows along the endwall have both been reported to significantly increase convective heat transfer. This study experiments high freestream turbulence on the airfoil's leading secondary flow vortices to determine the effects on the flowfield and the endwall convective heat transfer. Measured flowfield and heat transfer data were compared between low freestream turbulence levels (0.5%) and continuous unsteady turbulent levels (15%) that were generated using an airfoil grid. These experiments were conducted using a mid-span, five stage, axial flow geometry. Infrared thermography was used to measure surface temperatures on a constant heat flux plate placed on the endwall surface. Laser Doppler velocimetry (LDV) measurements were performed at all three corners of the main and fluctuating vortices (the leading edge secondary vortices). The results indicate that the main vortices for the leading edge secondary vortices were axial or bow-tie for low and high freestream turbulence cases. High turbulence levels in the leading edge endwall junction were attributed to a vortex breakdown for both the low and high freestream turbulence cases. While, in general, the high freestream turbulence increased the endwall heat transfer, low experiment noise fluctuations coincide with the regions having the most intense vortex motion.

INTRODUCTION

Along a turbine airfoil surface, the endwall convective heat transfer coefficient is a result of high turbulence originating in a combination of gas turbine engine. The platform of an airfoil endwall, a critical surface where secondary flow occurs, also has high convective heat transfer for which a complex flowfield. The complexity occurs from the secondary flow that develops in the three corners that occupy the platform surface. Both of these effects, high freestream turbulence effects on airfoil heat transfer and secondary flow effects on endwall heat transfer, have been discussed in the literature. What remains to be known is the combined effects of unsteady freestream turbulence and secondary flow on endwall heat transfer.

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Turbulence measurements taken at the exit of a variety of gas turbine combustors have shown that the levels can range between 10% and 40% (Goldman, et al., 1983; Kocenas and McDaniel, 1985; and Guelch, et al., 1991) with some indications that the integral length scale scales with the diameter of the turbine inlet in the combustor (Moss, 1972). As these high levels progress through the downstream turbine vane passages, there is a production of additional secondary flow turbulence energy levels at the exit of the passage (Radomsky and Thole, 1999). The effect of these high turbulence levels has on the airfoil endwall is significantly increased heat transfer along the leading edge and pressure side surfaces as well as more flow motion located forward on the suction side surface.

The secondary flow vortices secondary vortices take the form of a leading edge secondary vortex. This vortex splits into one that wraps around the suction surface and another that wraps around the pressure surface with the latter ultimately forming a passage vortex. As the design progresses downstream, the flow is determined by the passage vortex. Gaviglio and Bernal (1984) identified, through flow visualization and surface heat transfer, that high convective heat transfer coefficients coincided with the most intense vortex action. Kang and Thole (1999) observed through flowfield and heat transfer measurements that the peak heat transfer coincided with the downstream leg of both the boundary layer vortex and passage vortex. The downstream leg of these vortices being high speed flowlines that cross the endwall and then the boundary layer to ultimately increase the local heat transfer coefficient. As shown in several past endwall heat transfer studies (Chouhary, et al., 1986; and Taylor and Bernal, 1996; Kang, et al., 1999) the peak heat transfer occurs passage endwall regions from the pressure side of the airfoil to the suction side of the adjacent airfoil as the passage vortex moves in that direction.

Although there have been a number of studies documenting high freestream turbulence effects on airfoil heat transfer and there have been a number of endwall flowfield and heat transfer studies, there are no studies documenting endwall heat transfer at combustor level freestream turbulence. The work presented in this paper investigates the effect of high turbulence on an airfoil heat transfer. In particular, one of the regions having the highest heat transfer is the leading edge-on-endwall junction. Three-dimensional flowfield trans-

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layout



Not all rules of format are constant

Reports
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Figure 1

Fig. 1

fig. 1

Table 1

Table 1

table 1

equation 1

equation (1)

Eq. 1



Each typestyle has its own personality and power

Serif

Times New Roman
abcdefghijklmnopqr
stuvwxyz1234567890

Garamond
abcdefghijklmnopqr
stuvwxyz1234567890

Courier
abcdefghijklmnopqr
stuvwxyz1234567890

Sans Serif

Arial
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Arial Narrow
abcdefghijklmnopqr
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Tahoma
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Avoid large blocks of capital letters

~~TYPE IS TO READ~~

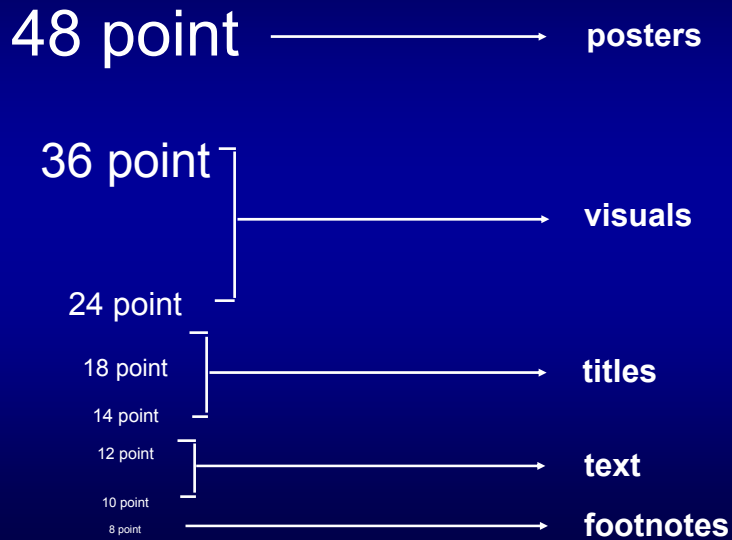
Type is to read

~~WORDS SET IN ALL CAPS USE
MORE SPACE THAN TEXT SET IN
LOWERCASE.~~

Words set in all caps use more
space than words set in lowercase.



Choose a type size that is easy to read



In your layouts, use white space for association, emphasis, and hierarchy

