

شبكة المعلومات الجامعية





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### جامعة عين شمس

التوثيق الالكتروني والميكروفيلم

### قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها علي هذه الأفلام قد أعدت دون أية تغيرات



### يجب أن

تحفظ هذه الأفلام بعيدا عن الغبار
% ١٥-١٥ مئوية ورطوية نسبية من ٢٥-١٠ مئوية ورطوية نسبية من ٢٠-٠٠ مئوية ورطوية نسبية من ٢٠-١٠ كان الفيار
To be Kept away from Dust in Dry Cool place of 15-25- c and relative humidity 20-40%





شبكة المعلومات الجامعية التوثيق الالكتروني والميكروفيلم

# وثائق لم ترد بلاصل

### يصعب قراءة بعض الوثائق

## A SHEAR-FLEXIBLE THEORY FOR ANISOTROPIC THIN-WALLED CLOSED-CELL BEAMS AND APPLICATIONS

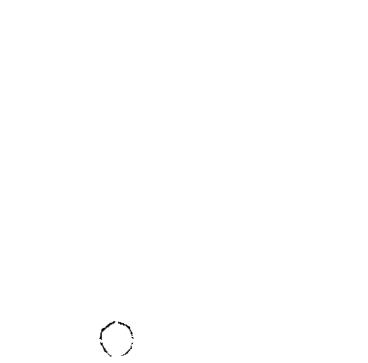
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#### MOSTAFA MOHAMMED ABDALLA

A thesis Submitted to the
Faculty of Engineering at Cairo University
in Partial Fulfillment of the Requirements for the Degree of
Master of Science
in

Aerospace Engineering

Faculty of Engineering, Cairo University
Giza, Egypt
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Under the Supervision of

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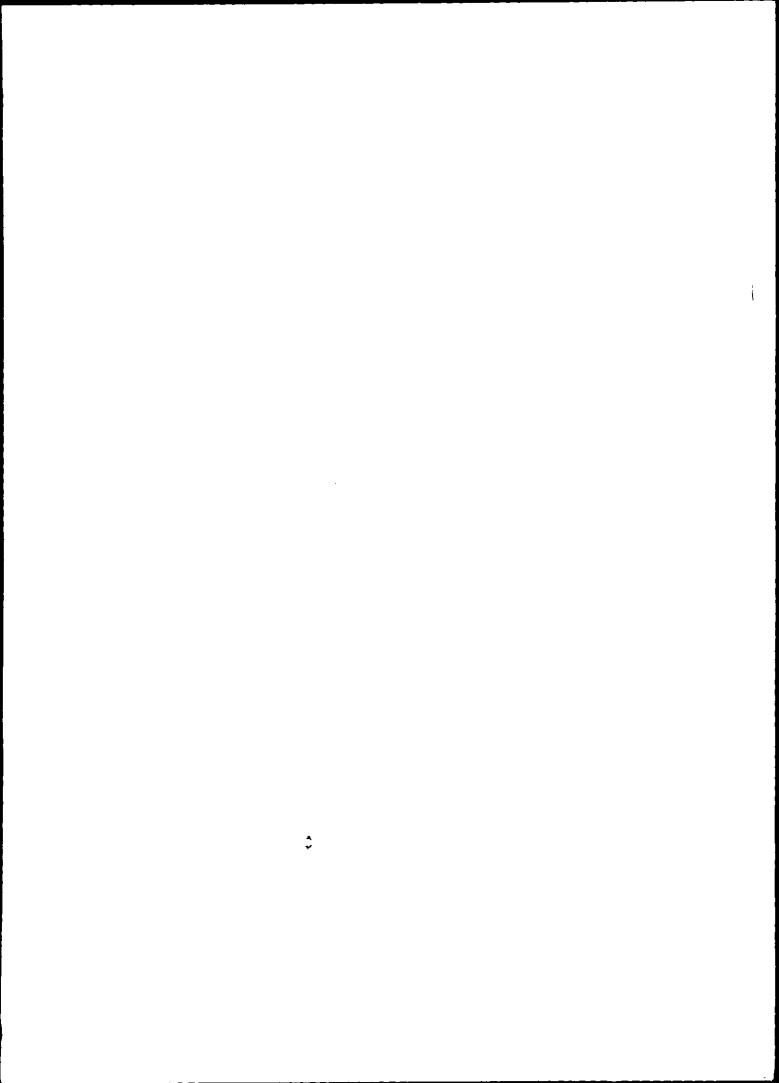
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#### **ABSTRACT**

In this work a consistent, limiting, shear-flexible theory for anisotropic thin-walled, closed-cell, beams is developed based on a non-shear, flexible, asymptotically correct, theory using the St. Venant's inverse approach. Closed form results for beam stiffness properties are obtained for simple geometric shapes and lay-up configurations. The theory is used to analytically assess the importance of including shear flexibility in the analysis of composite beams in static and dynamic problems.

To extend the scope of applicability of the theory, a one-dimensional finite element model is developed for cross sectional analysis that is capable of analyzing general multi-cell beams. This greatly reduces the number of degrees of freedom required for composite beam modeling compared to conventional finite element codes.

Three one dimensional finite elements for the anlysis of global static and dynamic behavior of composite beams are developed. Results are compared to exact analytic solutions indicating good convergence characteristics.

