הטכניון – מכון טכנולוגי לישראל **הפקולטה להנדסת מכונות**

סמינריון

הנך מוזמן/ת להרצאה סמינריונית של הפקולטה להנדסת מכונות שתתקיים ביום ה' 29.10.15 (טז' בחשון, תשע"ו), בבניין דן-קאהן, קומה 0, באודיטוריום 1 בשעה 14:30.

בתכנית הבן-יחידתית בהנדסת תכן וניהול הייצור

יצרה: עידו ברכה

מנחה: פרופ' דוד דורבן, הפקולטה להנדסת אווירונאוטיקה וחלל
מנחה שותף: ד"ר ברוך קרפ, הפקולטה להנדסת אווירונאוטיקה וחלל

על הנושא:

ניטור בריאות מבנית של מחברי ברגים תעופתיים באמצעות אפקטי קצה דינאמיים

Health Monitoring of Aerospace Structural Joints by Dynamic End Effects

להלן תקציר ההרצאה:

Structural health monitoring (SHM) is an emerging field aimed to improve readiness and reliability of existing structures, reduce their maintenance cost, and increase the cost effectiveness and performance of newly designed structures. That interdisciplinary field combines several scientific and engineering disciplines, culminating in measurement systems, which are part of the structure, providing continuous information on structures' condition.
Recent analytical and experimental studies on implementation of dynamic end effects provide a promising avenue for new and efficient SHM procedures. The underlying idea is based on the dynamic version of Saint Venant's principle manifested by the emergence of evanescent waves, in response to dynamic excitation. It has been demonstrated that those wave carry important data that reflects the health status of the end conditions. "End conditions" are considered here as a measure of a joint clamping condition with possible defects. The monitoring method is based on end effects as the key indication of the structure integrity since changes in the joint condition are reflected by the evanescent waves near the joint location.

This research is focused on further investigation of that method for monitoring both quality and integrity of aerospace bolted joints, by monitoring dynamic end effects as the main structural health marker. The fundamental assumption is that any change in the structural response of the joint indicates functional deterioration. It is noteworthy that while most of available studies on SHM examine wave-guide type geometries, the present work considers a complete structure where no preferred wave direction is clear at the outset. It is expected that small irregularities due to the presence of bolts, and damage due to loosening, can be detected upon comparative inspection (with respect to a definite baseline) of near field waves.

בברכה,

פרופ'/מ אמיר גת
מרכז הסמינרים