

הנדך מוזמן/ת להרצאה סמינריונית של הפקולטה להנדסת מכונות שתתקיים ביום ה' 21.02.2019  
(טז' באדר א', תשע"ט), בניין דן קאהן, אודיטוריום 1, 13:30.

**מרצה:** עמרי משעלי

**מנחה:** פרופ' ח חיים אברמוביץ', הפקולטה להנדסת אוירונאוטיקה וחלל

**מנחה שותף:** ד"ר עמנואל אור, רפאל

**על הנושא:**

## Examination by Tests of the Safety Factor in Solid Propellant Grain Under Ignition Pressure

The seminar will be given in Hebrew

### תקציר ההרצאה :

The main element in a solid rocket motor is the propellant, which is a viscoelastic material whose properties depend on temperature, time and strain rate. The two main mechanical loads applied on the propellant grain are thermal loading and ignition pressure.

The structural integrity assessment process which is used to evaluate the ability of a solid propellant grain to withstand the applied loads is a major factor in the design of solid rocket motors.

The prediction methods for the safety factor (SF) vary from countries and companies.

In the present study the structural integrity of a propellant has been examined through an analogue motor SEC (Strain Evolution Cylinder) under thermal and pressure loads. A dedicated experimental system had been designed, built and calibrated to test the SEC motors. In parallel structural analyses were performed using the finite element method to assess the failure and provide numerical results to be compared with a series of tests being carried out.

The tests performed showed an unexpected failure mode. The failure in 2 of the 3-tests performed that led to the grain failure, was by aggressive propellant ignition during increasing the pressure. Most probably the failure occurred, because of hot spot in the propagating crack tip.

בברכה,

ד"ר עמרי משעלי

מרכז הסמינרים