Technion-Israel Institute of Technology
Faculty of Mechanical Engineering

הטכניון-מכון טכנולוגי לישראל
הפקולטה להנדסת מכונות

סמינריון

הנך מוזמן/ת להרצאה סמינריונית של הפקולטה להנדסת מכונות, שתתקיים ביום ה' 8.06.17 (י"ד בסיון, תשע"ז), בניין דן-קאהן, אודיטוריום 1 , 12:00.

יוצה: יוסי כהן

מנחה: פרופ' אברהם שיצר

על הנושא:

ניתוח שדה טמפרטורה תלת מימדי של גשושי קפא המוחדרים לרקמה ממאירה

Analysis of the 3 dimensional temperature field around cryoprobes inserted into a malignant tumor

The seminar will be given in Hebrew

להלן תקציר ההרצאה:

This study was carried out as a continuation of various studies into cryosurgery conducted over the past few years. Analysis of temperature changes in the tumor is a central and key tool during the application of the cryosurgical procedure. The main purpose of cryosurgery is the total eradication of the tumor, while no less important is the minimization and prevention of excessive damage to surrounding healthy tissues. Contemporary medical practices combine imaging tools with computerized models which can map the thermal variations occurring inside the tumor (CT, MRI). However, these methods are expensive and cumbersome for online use in cryo-surgery. Hence Ultrasound (US) is employed for online tumor mapping. Advantages of US are its mobility, short operation times, and low cost operation relative to the other imaging methods. Nevertheless, US poses an inherent disadvantage for online surgery- its inability to map the thermal field inside the tumor that develops due to the activation of the cryo-probes. The resulting images display only the contour of the frozen tissue. This problem hinders the surgeon from ascertaining the total eradication of the tumor, since cell destruction temperature is considerably lower than the displayed tissue's freezing temperature (phase transition from liquid to solid). Studies conducted in the past concentrated on the analysis of two-dimensional temperature variations. This study aims at analyzing all cross-sections along the probe's active section thus obtaining the full 3-dimensional temperature field generated around the probe.

בברכה,

פרופ"א שאול אוסובסקי
מרכז הסמינרים