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

סמינריון

הנך מוזמן/ת להרצאה סמינריונית של הפקולטה להנדסת מכונות, שתתקיים ביום ב' 20.06.16 (יד' בסיון, תשע"ו), בבניין דן-קאהן, קומה 0, אודיטוריום 1, 14:30.

יוצא: ניר דרוקר

מנחה: פרופ' ערן שר, פקולטה להנדסת אוירונאוטיקה וחלל
מנחה שותף: ד"ר גדעון גולדויין, פקולטה להנדסת אוירונאוטיקה וחלל

על הנושא:

Study of Voltage-Current Characteristics Across the Ignition Gap of Internal Combustion Engines

The seminar will be given in Hebrew

להלן תקציר ההרצאה:

A preliminary examination of the voltage-current characteristics across the ignition gap of an internal combustion engine has been conducted. It is shown that the V-I characteristics may provide valuable information about the thermodynamic conditions inside the cylinder prior to the ignition process. In a later stage this information can be used to monitor and to optimize the engine operation in an on line fashion.

When two electrodes are submerged in a gas and electrical potential is applied between them, a very low electrical current flows between the electrodes through the gas. Such currents (dark discharge) can be observed prior to the breakdown event in which a high current is involved (spark discharge). The phenomenon of dark discharge was first observed by John Sealy Townsend back in 1900 and was explained as the ionization of gas molecules due to collisions with the free electrons in the gap which are accelerated by the electric field. The dark discharge current depends on the applied voltage, the gas density and its composition. Townsend's model for dark discharge describes the phenomenon vs. time up to the time of the spark event. However, the Townsend's model has been developed to a uniform electric field (which occurs between parallel plates electrodes) in air, and can hardly be applied to two thin electrodes and to the case of gas mixtures. Most past experiments have dealt with similar cases and where usually conducted at low pressures and densities. In this work, we develop a generalized model (based on the Townsend's model) for the case of non-uniform electric field and a mixture of gas components. In addition, an experimental work has been conducted to measure the relevant phenomena and to examine our model under suitable conditions that are prevailed in internal combustion engines.

בברכה,

שרון אמיר

מרכז הסמינרים