

הנך מוזמן/ת להרצאה סמינריונית של הפקולטה להנדסת מכונות, שתתקיים ביום ה' 17.08.17
(כה' באב, תשע"ז), בניין דן-קאהן, אודיטוריום 1, 13:30.

ירצה: גיא בן חיים

מנחה: ד"ר לאוניד טרטקובסקי

על הנושא:

HCCI Combustion in a Wankel Type Internal Combustion Engine

The seminar will be given in Hebrew

להלן תקציר ההרצאה:

The Wankel engine is a strong competitor in the unmanned aerial vehicle (UAV) market, mainly due to its inherent power-to-weight ratio advantage over piston engines. Its main disadvantages include lower efficiency and higher HC emissions.

The homogeneous charge compression ignition (HCCI) combustion process can potentially improve Wankel engine efficiency. In HCCI combustion, a premixed homogeneous charge of fuel and air enters the engine and is simultaneously ignited upon reaching its auto-ignition temperature. HCCI combustion results in rapid heat release, resembling more closely the constant volume heat supply of the theoretical Otto cycle.

The Wankel engine design might favour HCCI operation. With rapid heat release, combustion chamber heat-loss problems can be mitigated, while other problems associated with flame propagation are avoided completely, as no flame front exists per-se.

A simulation model for HCCI combustion was developed for an existing UAV Wankel engine. HCCI combustion is found to be feasible at UAV cruise operation and was optimized via the variation of intake air pre-heating, fuel type, equivalence ratio, EGR, compression ratio, port timings and areas, and turbocharging.

Results show a possible increase in brake efficiency between 5% and 25% at altitudes between 7500 and 15,000 feet, compared with spark ignited gasoline operation. Cruise HCCI operation shows great potential in extending UAV mission times or in reducing the amount of fuel required, thus reducing platform weight.

בברכה,

פרופ"ם שאול אולובסקי
מרכז הסמינרים