

סמינריון

הנדך מוזמן/ת להרצאה סמינריונית של הפקולטה להנדסת מכונות, שתתקיים ביום ה' 26.01.17 (כח' בטבת, תשע"ז), בניין ליידי-דייויס, חדר 641, 14:30.

ירצה: רועי גץ
מנחה: פרופ"מ שמואל גל

על הנושא:

כיווןן אלקטרוסטטי של גלים אסורים בדיאלקטריים רכים
Electrostatic tuning of band-gaps in soft dielectrics

The seminar will be given in English

להלן תקציר ההרצאה:

The frequency spectrum of periodic media exhibits bands, termed *band-gaps*, in which waves are forbidden from propagating. Such gaps in elastic composites can be employed to suppress noise, isolate undesired vibrations, or conversely guide waves. Composites having tunable gaps are desirable since they can comply with changing needs at different frequencies.

In this work, we demonstrate that these bands are tunable in fiber-composites made of *dielectric elastomer* phases, capable of undergoing large deformations and changing their properties when subjected to electric fields. Specifically, we investigate incremental waves propagating on top of a finite deformation caused by application of voltage. To this end, we formulate the three-dimensional equations governing the problem in a bulk and in a finite film. Using a numerical scheme, we solve these equations to explore the dependency of the motion on the phases properties, volume fraction, film thickness, and most importantly—the bias electric field. We thus evaluate the band structure of exemplary composites along with those made of commercially available materials. We find *complete* gaps which are independent of the propagation direction and the plane of the motion. Moreover, we find that the location and the width of these gaps are tunable by the voltage. These results suggest that dielectric elastomer devices can serve as tunable waveguides and filters.

בברכה,

פרופ"מ שמואל אוסובסקי
מרכז הסמינרים