הטכניון – מכון טכנולוגי לישראל

הפקולטה להנדסת מכונות

סמינריון

הנך מוזמן/ת להרצאה סמינריונית של הפקולטה להנדסת מכונות, שתתקיים ביום ב' 19.09.16 (טז' באלול, תשע"ו), בבניין דן-קאהן, קומה 0, אודיטוריום 1, 14:30.

ירצה: יוני פרידמן

מנחה: פרופ"מ אמיר גת

על הנושא:

Dynamics of an elastic sphere containing a thin creeping region and immersed in an acoustic region for similar viscous-elastic and acoustic time- and length-scales

The seminar will be given in English

להלן תקציר ההרצאה:

The characteristic time of viscous-elastic interaction scales linearly with the ratio of fluid viscosity to solid Young's modulus. For sufficiently large values of Young's modulus, both time- and length-scales of the viscous-elastic dynamics may be similar to acoustic time- and length-scales. However, the requirement of dominant viscous effects limits the validity of such regimes to micro-configurations. We here study the dynamics of an acoustic plane wave impinging on the surface of a sphere with an embedded creeping layer, focusing on configurations with similar viscous-elastic and acoustic time- and length-scales. By expanding the linearized spherical Reynolds equation into the relevant spectral series solution for the hyperbolic elastic regions, a global stiffness matrix of the layered elastic sphere was obtained. The maximal pressure difference induced by the acoustic wave on the creeping region was found to occur for identical viscous-elastic and acoustic length-scales. Comparing an elastic sphere with an embedded creeping layer to a fully elastic sphere, a significant reduction in magnitude and fluctuations (with regard to wavelength) are observed for both the displacements of the solid and target strength of the sphere. This effect was most significant for identical viscous-elastic and acoustic time-scales. This work relates viscous-elastic dynamics to acoustic scattering and may pave the way to the design of novel meta-materials with unique acoustic properties.

בברכה,

פרופ'/מ אמיר גת

מרכז הסמינרים