

סמינריון

הנדך מוזמן/ת להרצאה סמינריונית של הפקולטה להנדסת מכונות, שתתקיים ביום ה' 14.09.17
(כג' באלול, תשע"ז), בניין דן-קאהן, אודיטוריום 1, 13:30.

עמית וורגפט : ירצה

פרופ"מ אמיר גת : מנחה

על הנושא:

Dynamics of Liquid-filled Column and Truss Structure

The seminar will be given in Hebrew

להלן תקציר ההרצאה:

We analyze the dynamics of a rigid piston applying force on a viscous fluid contained within an elastic cylinder. The problem is governed by interaction between elastic deformation, the external force, fluidic pressure and the viscous flow at the annular gap between the piston and the cylinder. For an axial compressive force, acting to increase the pressure in the fluid, the problem is governed by viscous peeling dynamics. Van-Dyke's asymptotic scheme is applied in order to obtain a uniform solution for this case. In the opposite case of axial tension, the negative gauge pressure reduces the gap between the piston and the shell till a radial contact of the two solids. Asymptotic and numeric solutions are presented for the dynamics of the near-contact and full contact limits. We find that the piston exits the cylinder in a finite time for sufficiently small or large forces, while for an intermediate range of forces the radial contact creates a locking of the piston inside the cylinder. The examined configuration may be applied as a fluid-solid composite structural element, where the embedded fluid creates unique mechanical response and delays the onset of structural failure. To illustrate possible applications, we present the dynamics of a truss structure with members based on the analyzed liquid-filled cylinder, where forces are transmitted by pistons directly to the fluid.

בברכה,

פרופ"מ שאול אוסובסקי
מרכז הסמינרים