Technion-Israel Institute of Technology
Faculty of Mechanical Engineering

הטכניון-מכון טכנולוגי לישראל
הפקולטה להנדסת מכונות

סמינריון

הנך מוזמן/ת להרצאה סמינריונית של הפקולטה להנדסת מכונות, שתתקיים ביום ה׳
25.01.2018 (ט׳ בשבט, תשע״ח), בניין ליידי-דייויס, חדר 640, 13:30.

מרצה: דן נייגר

מנחה: פרופ׳ אולג גנדלמן

על הנושא:

בריחה של חלקיק מאולץ ומרוסן מבור פוטנציאלי: התגובה החולפת
Escape of a forced-damped particle from a potential well: transient response

The seminar will be given in Hebrew

להלן תקציר ההרצאה:

The reported work is devoted to an analysis of the escape process of a periodically forced and damped particle from a one-dimensional potential well. The particle is initially at rest, and the forcing is switched on at a certain time instance. Contrary to previous studies, the escape process is considered as a transient resonant response. The question is whether the particle will eventually leave the well. The present work is an extension of earlier results, obtained for the undamped case. For a particular model of the infinite range potential well, the problem can be formulated in terms of action angle variables. Assuming primary 1:1 resonance, one can consider the problem in terms of averaged transient dynamics. It turns out that, similarly to the undamped case, the escape process is governed by saddle points on the resonance manifold. A theoretical prediction of the minimal force amplitude required for the escape as function of the excitation frequency for various damping coefficients was provided. This prediction is of similar qualitative behavior to the particular case of no dissipation. Numeric simulations were in complete qualitative and reasonable quantitative agreement with the theoretical predictions except for small frequencies under 0.3. An explanation to these discrepancies was provided. The effects of harmonic noise and a symmetric triangle wave excitation on the results were also studied. It was found that both do not influence the qualitative behavior of the results. Numeric simulations of the triangle wave excitation were also in complete qualitative and reasonable quantitative agreement with the theoretical predictions for not too low excitation frequencies.

בברכה,

פרופ״מ מתי סאסו
מרכז הסמינרים