הטכניון – מכון טכנולוגי לישראל
הפקולטה להנדסת מכונות

TECHNION – Israel Institute of Technology
Faculty of Mechanical Engineering

SEMINAR - סמינר

הנך מוזמן/ת להרצאה סמינריונית של הפקולטה להנדסת מכונות, שתתקיים ביום ב' 2.05.2016
(כד' בניסן, תשע"ו), בבניין דן-קאהן, קומה 0, אודיטוריום 1, 14:30.

ירצה:

Prof. Avner Peleg

Department of Mathematics, State University of New York at Buffalo
Department of Exact Sciences, Afeka College of Engineering

על הנושא:

Controlling multiwavelength transmission in optical waveguides and in the atmosphere

The seminar will be given in English

להלן תקציר ההרצאה:

Multiwavelength optical systems have a wide range of applications, including wavelength-division-multiplexed (WDM) communication links, multiwavelength lasers, and pump-probe measurement systems. In this talk, I will present my research on two different multiwavelength systems. In the first part, I will consider propagation of N partially overlapping Gaussian laser beams with different wavelengths through atmospheric turbulence. I will show that both on-axis and off-axis scintillation are significantly reduced by optimizing the beam array with respect to the initial beam separation and beam width. The on-axis scintillation of the optimal N-beam array is inversely proportional to N, resulting in a 92% reduction for a nine-beam system compared with the single-beam value. The theoretical predictions are in good agreement with random phase-screen experiments with two and four beams.

In the second part, I will consider propagation of optical pulses in WDM waveguide systems, where each pulse undergoes many inter-pulse collisions. I will present a general framework for exploiting the collision-induced energy exchange between the optical pulses for transmission stabilization and switching. The method is based on showing that the collision-induced amplitude dynamics in N-channel waveguide systems can be described by N-dimensional Lotka-Volterra (LV) models. Stability analysis for the steady states of the LV models is used to develop ways for stabilizing the propagation and for achieving transmission switching. The method works well for a variety of nonlinear waveguides, including silica glass and silicon waveguides.

מארח: פרופ'/ח טל כרמון

בברכה,

פרופ'/מ אמיר גת
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