

# SEMINARAS

**2015 balandžio 16 d. 9:00, SRL-I 417 kab.**

## *Mindaugas Radžiūnas*

### Modeling, simulation and analysis of nonlinear dynamics in multisection semiconductor lasers

Weierstrass Institute for Applied Analysis and Stochastics, Leibniz Institute in  
Forschungsverbund Berlin e.V.

A nonlinear dynamics of narrow-waveguide multisection edge-emitting semiconductor lasers and coupled laser systems often can be described by the Traveling Wave model, which consists of a set of hyperbolic system of linear one space dimensional first order PDEs nonlinearly coupled with a system of ODEs, and can be formally written as a following system of equations:

$$\begin{aligned} \text{TW model:} \quad & \frac{d}{dt} \Psi = H(n) \Psi, \quad \frac{d}{dt} n = \varepsilon (I - R(n) - g(n) \| E \|^2), \\ & E = E(z, t) \in C^4, \quad n = n(z, t) \in \square, \quad z \in \bigcup_{k=1}^N [a_k, b_k], \\ \text{bound. cond.:} \quad & \begin{pmatrix} E_1(a_k) \\ E_2(b_k) \end{pmatrix} = \mathcal{T}_{2N \times 2N} \begin{pmatrix} E_1(b_k) \\ E_2(a_k) \end{pmatrix}. \end{aligned}$$

In this talk we shall present several methods for analysis of this system, what is very helpful when designing laser devices for specific applications.

**Kviečiame dalyvauti.**  
**Seminaro sekretorius A. Bugajev**