Control and Dynamics of Temporal Localized Structures in Semiconductor Lasers

By

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Host: Assoc. Prof. Sun Handong

Abstract

In this presentation I will describe recent experimental results on the control and on the dynamics of temporal localized structures in a passively mode-locked VCSEL. Localized pulses have been proposed as information bits and the possibility of their manipulation opens interesting perspectives for information processing. I will show that a modulation of the pumping current leads to control the position and the speed of the localized pulses within the cavity. In addition to pin the pulses at well defined positions, which enables clocking the bit flow, the pulses can be driven to collide one against the other, thus unveiling the purely repulsive mutual interaction.

Short Biography

Prof. Massimo Giudici was born in 1969 in Italy, he received Italian “Laurea in Fisica” in 1995. After one year experience in a laser manufacturing company “Pirelli Cavi-Milano”, he joined Institut Non Linéaire de Nice (INLN) in order to accomplish a Ph.D. thesis at “Université de Nice Sophia Antipolis” on "Non Linear Dynamics in Semiconductor Lasers with Optical feedback". He obtained his Ph.D. in 1999. After one year post-doc at IMEDEA in Spain where he investigated the role of noise in excitable optical systems, he came back to INLN as “Associate Researcher”. Since 2001 he is a teaching researcher at “Université de Nice-Sophia Antipolis”. His research interest revolves around the generation and control of localised structures in optical systems and semiconductor laser dynamics. In 2010 he has obtained the degree of full professor and he is at present deputy director of INLN. He is senior member of IEEE Photonics Journal. He is author of around 60 publications in refereed scientific journals.