Fonctions Optiques pour les Technologies de l'informatiON
http://foton.cnrs.fr
Insa de Rennes
20 av. des buttes de Coësmes
CS 70839
35708 Rennes cedex 7
T. 02 23 23 86 44
F. 02 23 23 86 18
UMR 6082

Thesis Defense of Salvatore PES on next 26th september.
You can communicate this information to colleagues, who may be interested.

Thesis Defense
Institut Foton – OHM team
Thursday 26th of september 2019, 2:00 pm (room GCU)

Nanostructures-based 1.55 µm emitting V(E)CSEL for microwave photonics and coherent communications

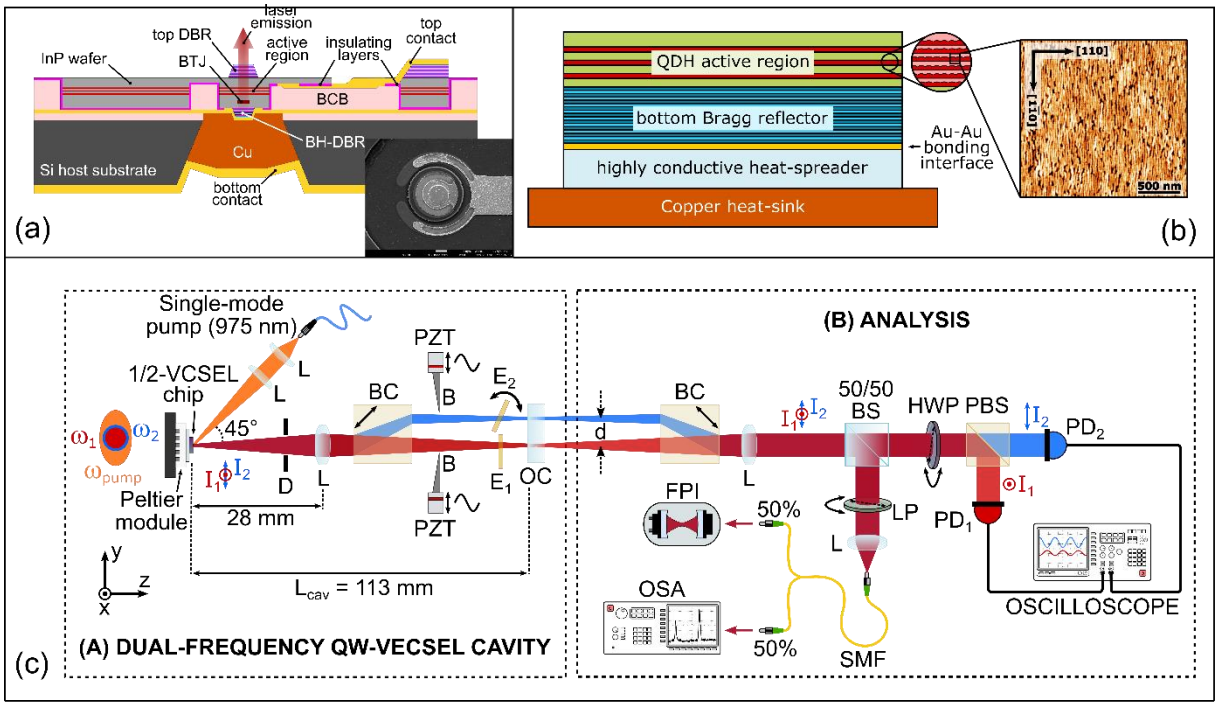
Salvatore PES

Jury :

Isabelle SAGNES	*Director of research, C2N, CNRS*	Examinator
Daniel DOLFI	*Director of Physics Group, Thales R&T, France*	Examinator
Mircea GUINA	*Professor, Tampere University of Technology, Finland*	Member
Stéphane CALVEZ	*Researcher , LAAS , CNRS*	Member
Philippe ADAM	*Person in charge of photonics, DGA-MRIS, Paris*	Invited
Cyril PARANTHOEN	*Assistant Professor, Institut Foton, INSA Rennes*	PhD Manager
Mehdi ALOUINI	*Professor, Institut Foton, Rennes University*	PhD Supervisor
Hervé FOLLIOT	*Professor, Institut Foton, INSA Rennes*	PhD Supervisor

Abstract

The work presented in this dissertation focus on the development of InP-based semiconductor vertical-cavity lasers, based on quantum nanostructured and emitting at the telecom wavelengths (1550-1600 nm). A new technological process for the realization of compact VCSEL is described. This process (named TSHEC) has been employed to realize optically-pumped VCSELs, integrated on a host Si-platform, with good performances. The same process has been adapted to develop an electrically-driven version of VCSEL: a preliminary study of the confinement section based on InGaAs-BTJ is presented, together with the development of a mask set. Thanks to the development of the LC µ-cell technology (in collaboration with LAAS, IMT Atlantique et C2N), we realized a tunable photodiode at 1.55 µm, and a tunable VCSEL is currently under development. This work also presents the first realization of a 1.6 µm-emitting optically-pumped quantum dashes-based VECSELs, and its characterization in multi-mode and single frequency regime. Finally, the realization of an experimental setup for the investigation of the coupling between two orthogonal eigenstates of a bi-frequency 1.54 µm-emitting SQW-VECSEL has been conceived and realized. This setup, which allowed the direct quantification of the coupling constant on such a device, in the near future will allow performing the same study on anisotropic structures like quantum dashes or quantum dots, with the objective of studying the inhomogeneous broadening effect observed in these gain regions.



***KEYWORDS** : V(E)CSELs, quantum dashes, tunable devices, liquid crystals, bi-frequency lasers*