

GaN-AlGaN heterostructure grown on various orientations as UV light emitters

Prof. Bernard Gil

About speaker

Born in France, 1957, Bernard Gil got his Master in fundamental physics near the university Blaise Pascal in Clermont-Ferrand. Then he moved to the university of Montpellier to study solid state physics and to get his PhD at the end of 1981. He then integrated CNRS in 1982 as a regular researcher. He was promoted to the first class of regular researchers in 1986 and promoted as a director of research (equivalent of full professor degree) in 1995, and awarded first class director of research at CNRS in 2007

Gil is an experimentalist expert in optical spectroscopy which has been first studying Raman scattering processes in TiO₂ (rutile) crystals deformed by external strain fields before to move to the physics of defects in GaP: N under external strain fields. He then re-oriented in the second part of the eighties his interest to quantum wells and superlattices of the (In,Ga)As-(Ga,Al)As and Zn(S,Se,Te)-(Zn,Cd)Se types before to shift to nitrides and oxides in the first part of the nineties.

Gil, H factor 40, authored more than 320 publications, trained about 25 PhD students and post-docs, organized a lot of scientific conferences at the internal scales.

Gil directed the Group of research on semiconductors from 2003 to 2010, before to direct the Institute of Physics at Montpellier (a consortium of laboratories that work from quantum gravity to biophysics) till the end of 2014.

Gil has been awarded Doctor Honoris Causa by the Saint Petersburg University in 2012 (after proposal of Professor Kavokin) and by the Meijo University of Nagoya in 2013(after proposal of Professor Akasaki, Nobel Prize). He has been and is still elected to various councils of the French academic systems and he is routinely asked to serve for evaluating European research institutes.

Abstract

Group III nitrides are the ad-hoc candidates for the realization of light emitting devices susceptible to operate in the visible part of the electromagnetic radiation spectrum, and at its both interfaces.

a considerable amount of work has been done regarding blue and green light emitters and little is now offered to the academic laboratories in this crowded research area. Interesting topic is how to overcome the green gap physics and how to improve the performances of yellow, orange and red light emitters in order to challenge the utilization of zinc-blende semiconductors giving birth to a full nitride-based optoelectronics. This mainly requires to master the physics of indium-rich alloys. Although this is of great interest to me I will focus in this talk on the hetero-structures for ultraviolet applications which are as challenging as the precedingly mentioned are. the difficulties are of different origins. i will discuss the optical properties of GaN-AlGaN multi quantum well systems grown on various orientations: polar, non polar and semi polar orientations. I will emphasize the importance of the substrate quality , I will discuss global trends independent of the growth methods, and I will discriminate radiative and non radiative recombination rates.

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