Centre DE Nanosciences & DE Nanotechnologies

C2N General Seminar

Friday November 8th 2019 - 10h 00

Amphitheater of C2N

"Remote epitaxy at C2N: transferable III-V devices for simplified integration and cost reduction"

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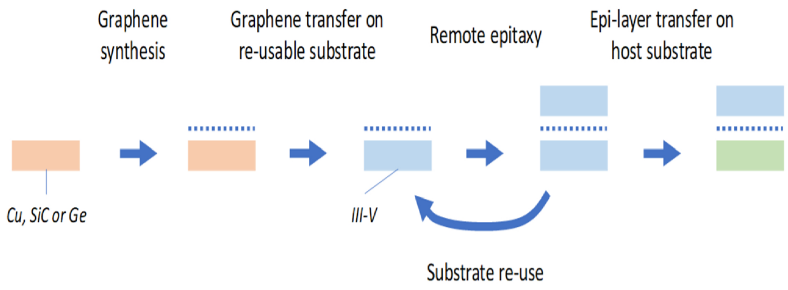

Overview of the remote epitaxy process, highlighting the key technological steps.

I will present in this seminar my project for the development of the remote epitaxy, which consists in the epitaxy on a crystalline substrate covered by a monolayer of graphene. It was shown to allow the growth of transferable epilayers, for devices combining III-V with other materials, or substrate recycling for cost reduction. Before exploring the challenges and opportunities of the remote epitaxy, I will introduce two projects I previously conducted: the first one dealing with materials characterisation, the second one consisting in an original device architecture. Those methods find application in various semiconductor devices, with examples given on photovoltaics for this presentation.

A hyperspectral imager will be firstly introduced, which records luminescence signals with spatial and spectral resolution, and an absolute intensity calibration. It will be shown how this setup allows measuring quasi-IV curves without contacts, and characterising inhomogeneous optoelectronic properties down to the micrometer scale. A method for mesa sidewall passivation, inspired by the working principle of MOSFETs, will then be detailed, in which the lateral spreading layer conductivity is modulated. Such a passivation method is strongly needed for micro-sized solar cells, used under sunlight concentration or for distributed power generation.

Amaury Delamarre I completed my PhD at the Institut de Dévelopement de l'Energie Photovoltaïque (IRDEP, now IPVF) on the development of new characterisation methods of solar cells by luminescence. I then moved to the Sugiyama and Nakano laboratory at the University of Tokyo, and took part in the LIA NextPV, where I worked on the development of high efficiency III-V solar cells fabricated by MOVPE. I recently moved to the C2N where I will develop the remote epitaxy for III-V device fabrication.

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