In-situ analysis: improved nk data base for III-Nitrides in EpiNet 2015 release

Recently LayTec and our R&D partners published high-accuracy high-temperature nk data of Arsenides and Phosphides enabling for these materials in-situ process control of layer thickness and composition at the same level of accuracy as XRD or PL [CS ManTech 2015 and EWMOVPE 2015]. At the forthcoming ICNS-11, we will present a similarly expanded and improved nk database for the III-Nitrides as part of the latest version of our **EpiNet software**. These high accuracy nk data in conjunction with **Pyro 400** wafer temperature control will open the pathway to a more comprehensive and direct SPC of III-Nitride based manufacturing on pss, silicon and, most importantly, on GaN wafers. For more details please see the **copy of slides** as presented at OMVPE 2015 on www.laytec.de.

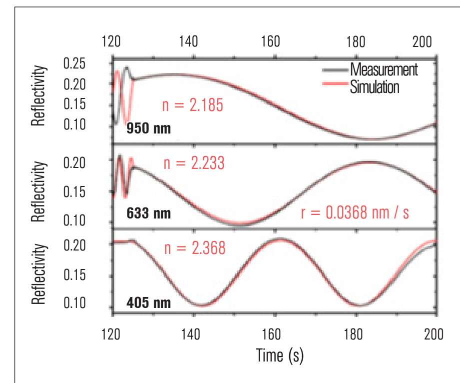

Fig 1: Refractive index as determined at growth temperature for AlInN lattice matched to GaN. These data have been presented by Christoph Berger et al. at OMVPE (August 2015, BigSky, Montana) and are results of an collaboration between Otto von Guericke, University of Magdeburg and LayTec.

LayTec metrology speeds up process development on 100 mm (11-22) GaN / r-PSS

At last week's OMVPE Workshop in BigSky (Montana) Dr. Frank Brunner of Ferdinand-Braun-Institute Berlin, Germany presented his latest results on growth of (11-22) GaN / r-PSS in an AIX 2600G3-HT reactor (8x4" configuration). He underlined in his talk that cost-efficient growth process optimization for these semi-polar GaN structures on 100 mm PSS substrates would not have been possible without comprehensive in-situ metrology. Hence, an **EpiCurve® TT** (for reflectance and wafer bow sensing) and a **Pyro 400** (for GaN temperature control) worked together by utilizing the two viewports of this (modified) Aix 2600G3-HT reactor top-plate. In Fig. 2 is shown how all details of the highly complex growth mode show-up in the combined reflectance, wafer bow and temperature data. Please see www.laytec.de for a copy of all the **related slides**.

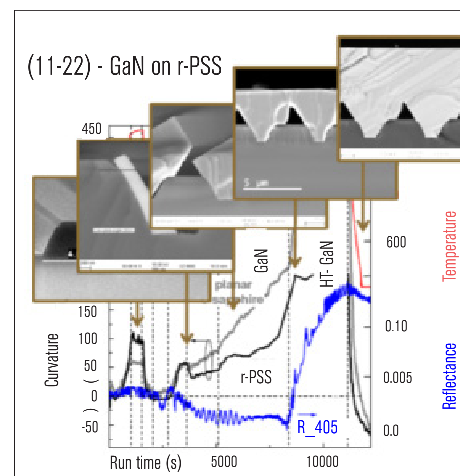

Fig. 2: Growth of (11-22) GaN on r-PSS and related in-situ data (F. Brunner et al. at OMVPE 2015, please, see **related slides** at www.laytec.de for more details).

New EpiCurve® TT for large single-wafers in D125 high-speed rotation reactors

A new version of **EpiCurve® TT** has been developed for combined reflectance, wafer temperature and wafer bow measurements on large single-wafers in D125 high-speed rotation reactors. The first system will be shipped to a customer in USA in September 2015.

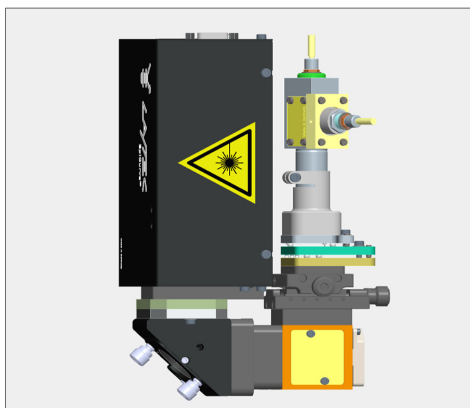

Fig 3: EpiCurve® TT for large single-wafer configurations in high-speed rotation reactors. EpiTT optical head (right) and Curvature sensor head (left) are combined. The design is extremely compact for enabling upgrade solutions also under limited space conditions.

It closes a technology gap formerly existing for large single wafer configurations in high-speed rotation reactors due to limitations of scanning single-beam deflectometry. LayTec combined in this system its high-resolution multi-beam wafer bow sensing with 3-wavelength reflectance and wafer temperature measurement. The system is equipped with our very latest **EpiNet software** package that allows for thickness and composition monitoring for specific material classes at an accuracy level formerly reached only by XRD.

You can meet us at the following workshops, conferences and trade fairs:

30 Aug – 04 Sep 2015 | **ICNS -11, 2015** | Beijing, China | Booth #2 |
02 Nov – 04 Nov 2015 | **ChinaSSL 2015** | Shenzhen, China |
LayTec presents: Integrated metrology – latest progress for enabling advanced manufacturing of III-Nitride based LEDs (visible and UV) and Lasers |
08 Nov – 13 Nov 2015 | **ISGN-6** | Hamamatsu, Japan |