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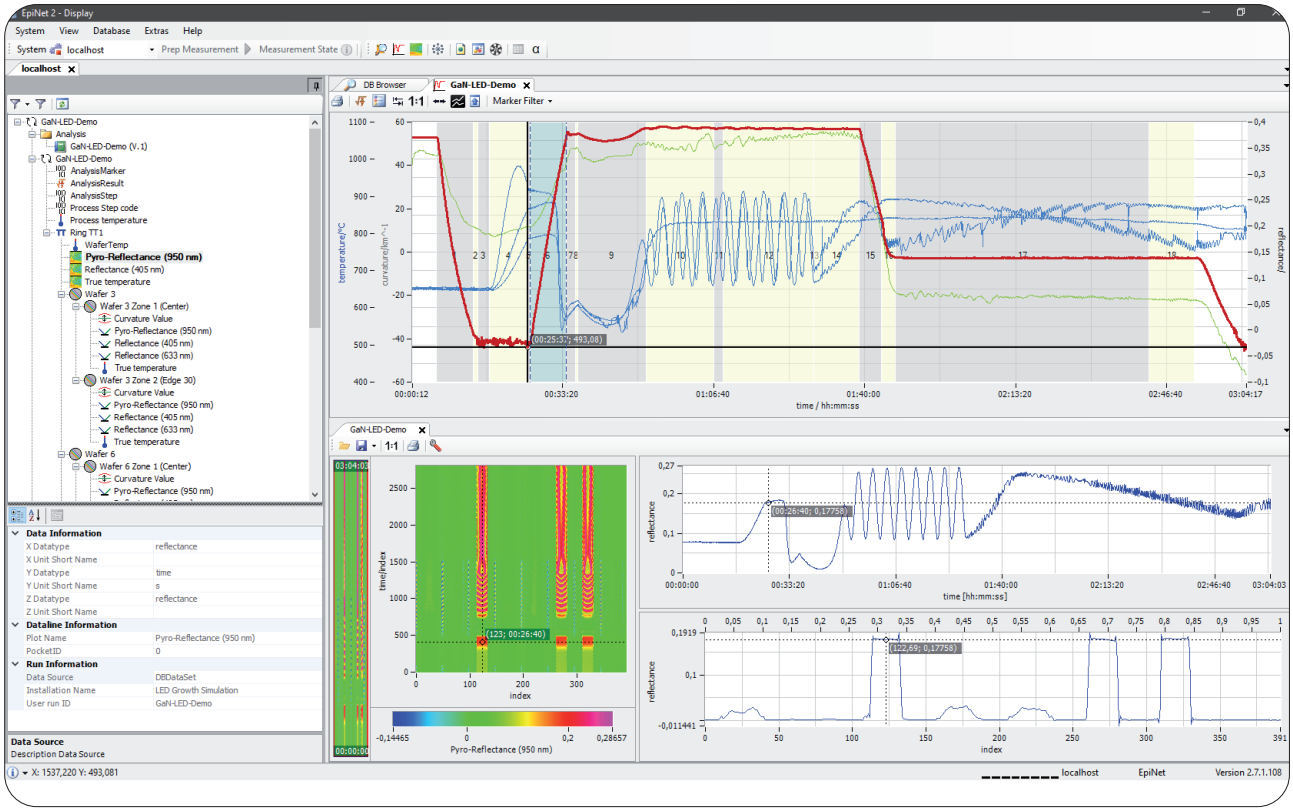
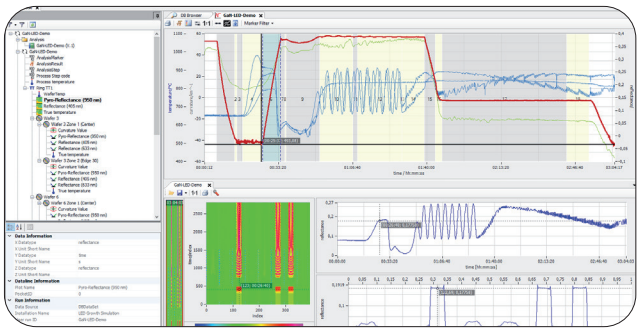
EpiNet 2022



In-situ control & analysis software

EpiNet 2022 – Improve yield, save costs!



EpiNet 2022 is a software for control, analysis and optimization of epitaxial processes in production and development of LEDs, laser diodes, VCSEL, HEMT, HBT and other electronic and optoelectronic devices.
The software extracts key figures about wafers' behavior during growth. In run-to-run control and in statistical process control, these key figures are used to improve yield and process capacity. EpiNet 2022 can be integrated into automated fab workflow providing from simple plain-text files to sophisticated live SECS / GEM integration.

Customer's benefits

- In-situ process control with ex-situ accuracy even for very thin layers
- Control of complex production processes on operator level
- Fast in-spec / out-of-spec indication for stop or go decisions
- High automation saves operator's time, eliminates error sources and makes in-situ control easy without training
- Engineer's access level for sophisticated data analysis

Measurements

- Time resolved, wafer resolved, zone resolved in-situ measurements of:
  - Emissivity corrected pyrometry
  - Multi-wavelength reflectometry
  - Wafer curvature including asphericity measurements
- Multi pocket mode
- Window coating tracking (Alpha history)
- Wafer backside emissivity correction

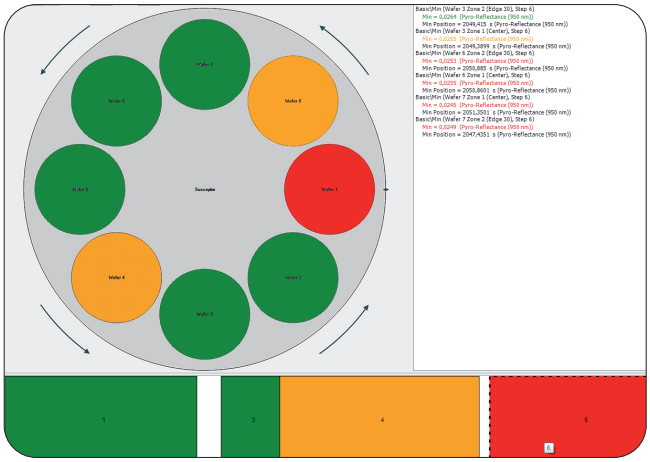
Analysis

- Analysis recipe for synchronized step-by-step analysis of the growth process
- Fast determination (even for very thin layers) of:
  - Growth rate
  - Layer thickness
  - Optical constants
- Extensive data base of optical constants of numerous material (e.g. GaN, AlN, AlGaAs)
- Numerous statistical analysis: average, maximum, minimum, standard deviation, determination of the slope (e.g. for temperature, curvature)
- Improved and accelerated NKR fits
- Device-calibrated, substrate or layer referenced absolute reflection
- Improved composition analysis for AlGaAs and AlInGaP
- Improved dispersion data:
  - AlGaAs, AlAs, GaAs from 20 °C to 750 °C
  - AlGaN, AlN GaN from 20 °C to 1500 °C
  - Sapphire from 20 °C to 1500 °C
  - SiC-4H from 20 °C to 2000 °C
- Dedicated analyses for specialized applications (e.g. GaN 3D - recovery time)

Features

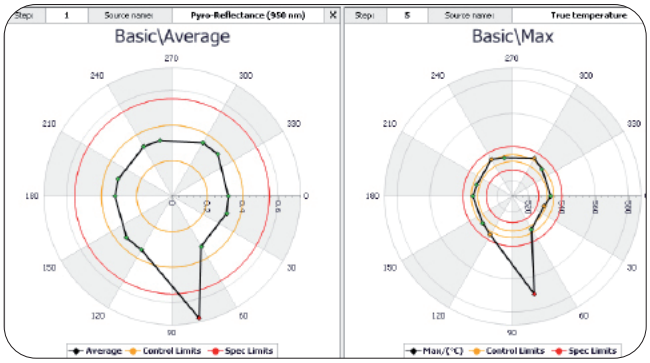
Operator‘s view: PocketGuard

- Quick check of all monitored wafers during the run at one glance
- All wafers are color-coded by user-defined in-spec / out-of-spec criteria and visualized as they are positioned on the susceptor
- In-spec / out-of-spec criteria can be set for all LayTec‘s analysis features
- Customer can easily set up procedures for corrective actions based on PocketGuard information



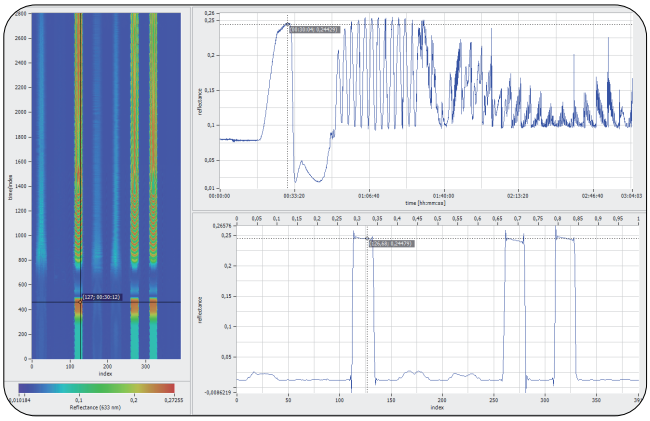
Wafer-to-Wafer view for post-run analysis

- Analysis results for all wafers shown in separate web charts (polar charts)
- Easy comparison of wafers for run homogeneity check
- Fast detection of outliers – wafer zones that are out of specification limits (red circle) or control limits (yellow circles)



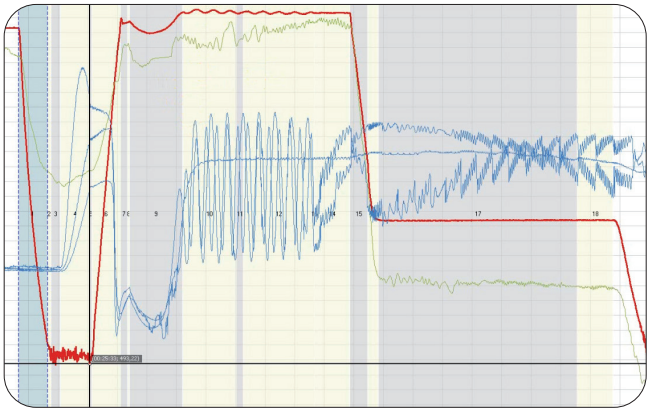
Color plots and line scans

- Color plots (left): time and space-resolved measurements for quick fingerprinting and visualization
- Line scans (low right) show wafer homogeneity during growth
- Time-resolved transients (upper right) are the basis for detailed analysis of growth performance (see Transient view below)



Expert analysis: Transient view

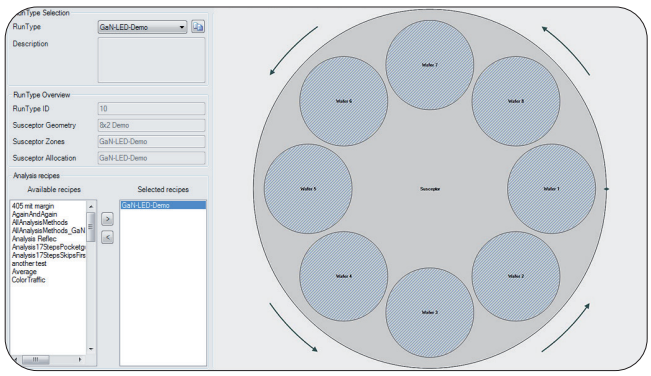
- Complex data comparison of critical process parameters down to single data points across zones, wafers and runs
- Transients can be segmented manually or automatically into growth steps
- Automated analyses of any step to extract process information from raw data (e.g. composition, growth rate etc.)
- Pre-configuration of analyses algorithms as recipes for repeated or automated use



Further features

Configuration panel: customized run type management

- Visualization of susceptor geometry for setting measurement zones (available for single and multi-pocket configurations)
- Wafer-specific settings for each pocket: susceptor material, pocket material, wafer substrate, thickness and surface condition
- **For operators:**
  - Use of pre-configured analysis recipes
  - Automated start of in-situ measurements



Golden Run feature

- Pre-selection of earlier measured reference transients and comparison with the current run
- Ideal software tool for wafer-to-wafer, run-to-run and tool-to-tool comparison during epitaxial growth processes to achieve constant device quality

Interfaces

- Export interfaces: SECS / GEM, SNMP, TCP / IP, IF-EPI (hardware), Data File Export
- Import filters for various epitaxial data formats (e.g., DRT) for viewing, analysis and comparison
- Improved export format for convenient import scripting into MES
- User-defined logical mapping of wafer pockets

Miscellaneous

- Data hub based system for high flexibility in customization
- Database maintenance: automated jobs, improved throughput, data management
- Replay feature available
- For office use, EpiNet 2022 supports Windows 10 compatible PCs

Licence packages

- Basic / OEM package for basic operation and data analysis
- Premium package for advanced analysis and process understanding
- Additional licences for specific features

For more information about licence packages please contact sales@laytec.de

www.laytec.de/epinet

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