EZ-CURVE® Real-time curvature measurement

Monitor your thin film deposition and vacuum treatment process in real-time with Riber Magnification Inferred Curvature (MIC) tool

EZ-Curve® MIC equipment installed on Riber MBE412 system

**MAIN BENEFITS**

- **In situ** stress, bow and curvature measurement, **in real time**
- Set precise growth patterns and **monitor deviations**
- Detect specific growth events and **retrieve fundamental knowledge** about growth mechanisms
- Suitable for **various thin films deposition techniques** (CVD, MBE, PVD,...) and **vacuum treatment process** (plasma etching, annealing, quenching ...)
- **Unrivalled** curvature sensitivity
- **Simultaneous** spherical and cylindrical bowing, **anisotropy measurement**
- Compatible with **low lattice mismatch systems** like AlGaAs/GaAs
- **Thick wafer** compatible - up to few mm
- **Highly stable** & alignment-free measurement
- Wide-range wavelength source – **immune to reflectivity change**, no need to adjust exposure time
- **Immunity to wafer flatness** – possible use with patterned wafer

Continuous observation of a complete structure 17 hours growth, 7.5µm thick VCSEL + modulator

*L. Marigo-Lombart - PhD thesis - LAAS-CNRS - 2018*
### Parameter Specifications

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specifications</th>
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<tbody>
<tr>
<td>Curvature range (min - max)</td>
<td>0,0008 - 200 000 km⁻¹</td>
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<tr>
<td>Sensitivity (1-std dev)</td>
<td>Up to 8x10⁻⁷ m⁻¹ (5x5 matrix, 5s integration / 500 points – θ = 70°)</td>
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<tr>
<td>Measured standard deviation</td>
<td>8.33x10⁻⁶ m⁻¹ (θ = 0°) // 2.85x10⁻⁶ m⁻¹ (θ = 70°)</td>
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<tr>
<td>Radius range (max – min)</td>
<td>1 250 000 - 5x10⁻³ m</td>
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<tr>
<td>Source lifetime</td>
<td>50 000 h</td>
</tr>
<tr>
<td>Measurement frequency</td>
<td>100 Hz</td>
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<tr>
<td>Rotation speed range</td>
<td>0-100 rpm</td>
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<td>Viewport to sample distance</td>
<td>Adjustable from 75 mm - depending on vacuum chamber dimensions</td>
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<td>Flexible installation angle on the reactor</td>
<td>0 - 70°</td>
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### SOFTWARE

- Curvature, Stress, Phase and Anisotropy measurement & display
- Intuitive data acquisition
- Powerful data saving functions
- Real time mode up to 100 fps
- Flexibility to share data with other software incl. Riber Crystal XE
- Post-processing and data treatment
- Remote modbus interface

**EZ-Curve software interface**