

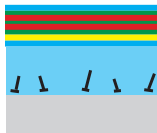
SEMICONDUCTOR WAFERS CRYSTALLINE QUALITY

Crystalline quality is an important parameter to monitor for ensuring high device yield and performance. Measuring crystalline quality is also important for studying deposition processes for growth of epitaxial layers. Typical features determined in crystalline quality applications are:

- 2D visualization of macroscopic flaws
- Crystal quality of buffer layer
- Wafer curvature
- Wafer uniformity using wafer mapping
- Interface grading and uniformity



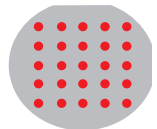
Study of macroscopic flaws using Berg-Barrett topography



Layer or substrate quality using high-resolution rocking curves and 2-axis scans peak width (FWHM) measurement



Wafer curvature using high-resolution rocking curves

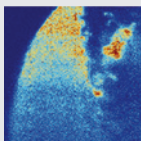


Wafer mapping for various measurements



Grading and interface quality using reflectometry

2D methods



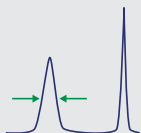
Berg Barrett topography*

Analysis using Reflectivity

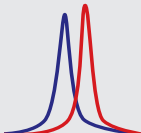


High-resolution reflectivity curve for interface quality and density grading

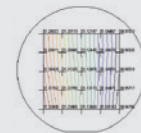
Analysis using Epitaxy



Crystal quality by peak width (FWHM) measurement



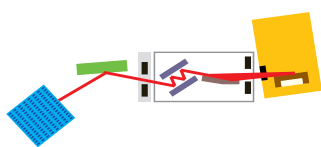
High-resolution rocking curve analysis of curvature



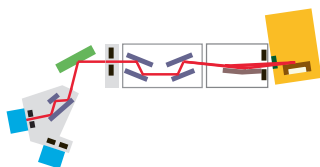
Wafer uniformity by wafer mapping



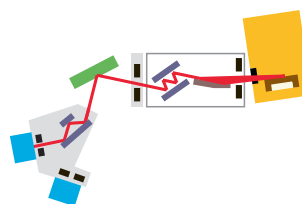
X'PERT³ MRD (XL) CONFIGURATIONS FOR SEMICONDUCTOR WAFERS **CRYSTALLINE QUALITY**



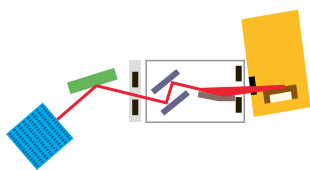
* Hybrid 4-bounce monochromator and 2D detector



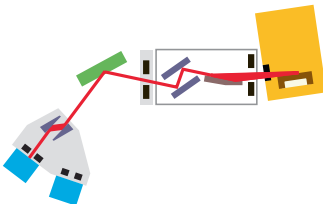
Parallel beam mirror with four crystal monochromator and 3-bounce triple-axis analyzer



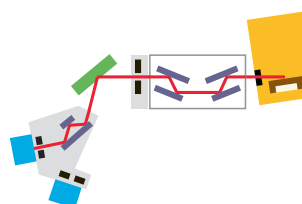
Hybrid 4-bounce monochromator and 3-bounce triple-axis analyzer



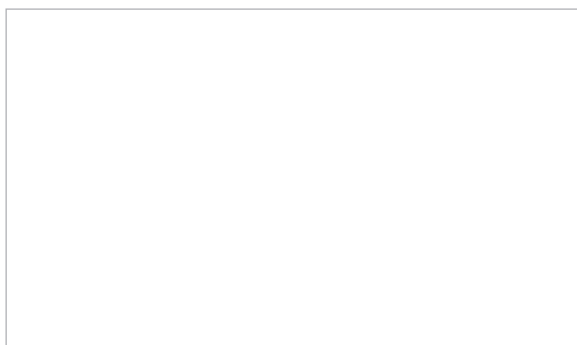
* Hybrid 2-bounce monochromator and 2D detector



Hybrid 2-bounce monochromator and 2-bounce triple-axis analyzer



Four-crystal monochromator and 3-bounce triple-axis analyzer



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