



k-Space Associates, Inc.



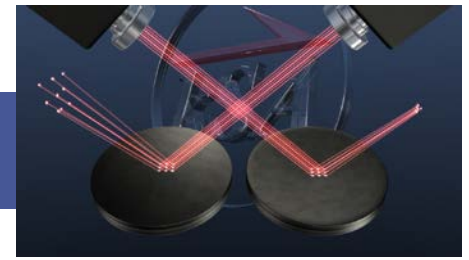
kSA MOS

High Resolution In-Situ Curvature & Stress Monitoring Proven For Thin-Film Deposition

Directly Measure Stress-Induced 2D Curvature & Bow in Real-Time

The kSA Multi-beam Optical Sensor (**MOS**) is a thin-film stress and wafer curvature measurement tool with integrated real-time feedback for process control. This patented 2D laser-based system is highly sensitive and is proven to be extremely robust. With the optimized optics and detection system capturing a full 2D array of reflected parallel laser beams, kSA MOS uses proven real-time fitting algorithms to measure radius-of-curvatures up to 50 kilometers --**sensitive enough to see less than single monolayer of mismatched material deposited!** Because the technique is optically based, it is compatible with harsh environments. kSA MOS is ideally suited for real-time feedback to process control systems in the production or research environment.

Features	Benefits	Applications
Patented 2D laser spot array reflected off sample surface	Provides curvature, stress, and bow in both x and y planes simultaneously	Direct observation of stress asymmetry, engineer stress and strain in 2D
Single laser generates full array of spots for measurement	Virtually immune to system vibration--only relative spot spacing changes are important for curvature measurements	Can be used with vacuum systems and processing chambers which have sample vibration
Patented, automatic beam steering mirror	Keeps laser spot array on center of detector, maximize curvature range	Able to handle extreme curvature changes with heavily mismatched materials
Patented, dynamic reflectivity control	Automatically adjusts laser power and detector exposure times through wide surface reflectivity changes	Automatic adjustments to 1000x changes in reflectivity seen during deposition or processing
Optional real-time thickness, growth rate, optical constants (n,k) analysis module	Direct monitoring of semi-transparent films	Control layer thickness and optical properties of material during deposition



Standard Hardware and Software

- Solid state, high speed electronics run from single computer provide acquisition rates up to 60 Hz
- Single viewport and dual viewport options to suit most any vacuum deposition or processing chamber
- Measurements available during sample rotation up to 100 RPM
- Multiple laser options to match material reflectivity properties
- Analog or TCP/IP communications for process monitoring and control system integration
- Full analysis of spot distribution, spacing, and reflectivity
- Record full image files for offline analysis

Hardware Options

Option/Part Number

Description

MOS-GM

Real time analysis of growth rate, thickness, and optical constants (n,k)

MOS-TRG

Laser-based rotational triggering module for sample rotation synchronization

MOS L/U-532

Upgrade to 532nm laser and optics for matching thin-film materials reflectivity

MOS L/U-405

Upgrade to 405nm laser and optics for matching thin-film materials reflectivity

Performance Specifications

Sample Radius of Curvature Range

2m-50km*

*Dependent on chamber

Surface Reflectivity

0.1 to 100% at laser wavelength

Sample Rotation

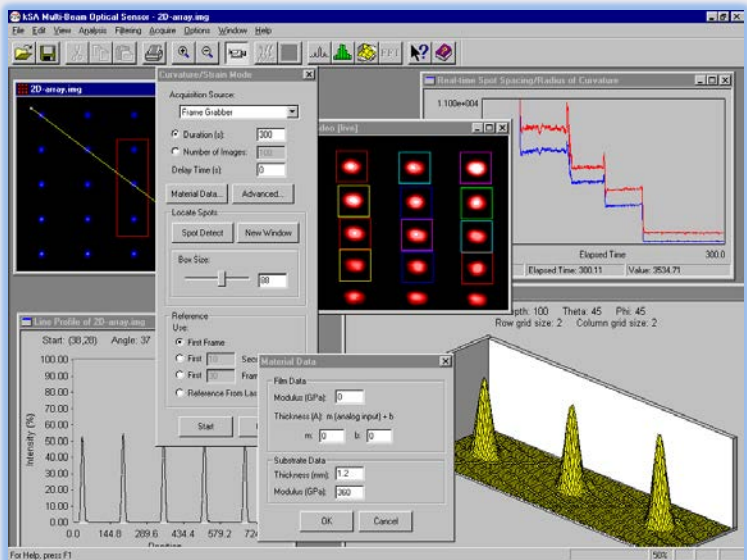
0-100 RPM

Viewport to Sample Distance

50mm-1m

Viewport Mount

1.33" to 6" CF



Your partner in thin film metrology

k-Space Associates, Inc., is a leading supplier to the surface science and thin-film technology industries. Since 1992, we've delivered the most advanced thin-film metrology tools and software thanks to close collaboration with our worldwide customer base.