

Ion-assisted Pulsed Laser Deposition System



- Stand-alone turn-key Ion-assisted PLD System.
- Deposition of biaxially textured templates on amorphous and polycrystalline substrates.
- Deposition of epitaxial films, multilayer heterostructures and Superlattices.
- Deposition of textured MgO films using RHEED diagnostics.
- Oxygen compatibility for oxide film depositions.
- Ion incidence angle: 45° - 55° with respect to substrate normal.

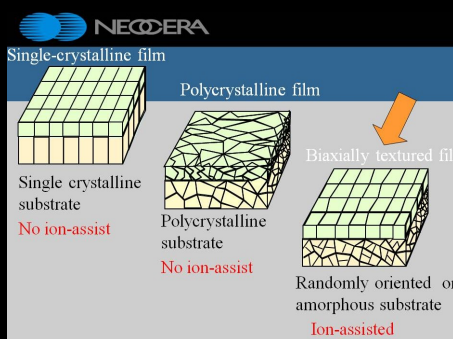


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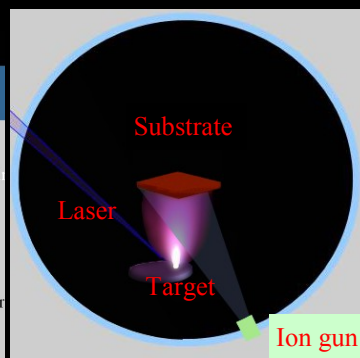
Pioneer 180 Ion-assisted PLD System

Neocera Ion-assisted PLD Systems are used to create biaxially textured templates (films) on amorphous or polycrystalline substrates by optimizing PLD deposition rate and ion etch rate. Biaxial texturing is normally carried out at room temperature, facilitating the use of many substrates that otherwise do not permit high quality film growth. Ytria Stabilized Zirconia (YSZ) and Magnesium Oxide (MgO) are amongst the most common materials used for texturing. Originally proposed for depositing biaxially textured high-temperature superconducting YBCO films on metallic substrates, ion-assisted PLD can be extended to many technologically important substrates where surface texturing is critically important for applications. After depositing biaxially textured templates, the active device layers such as YBCO, PZT, CIGS etc can be deposited at elevated temperatures.

Ion-assisted PLD



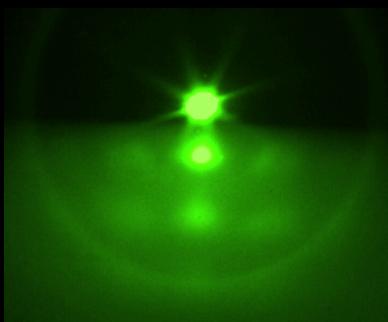
Experimental set-up



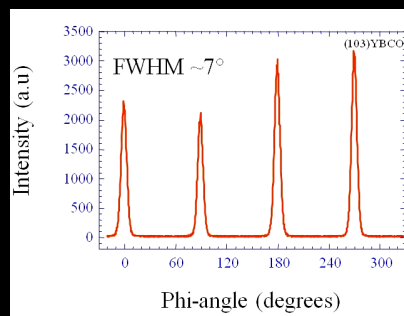
Ion-assisted PLD – Specifications

Feature	Details
1. Substrate size	2" diameter standard, (4" and 6" on request)
2. Chamber size	12" and 18" diameter.
3. Base vacuum	5×10^{-7} Torr Standard 5×10^{-9} Torr (upgrade)
4. Substrate heating	1000°C (Laser heater)* 950°C (Conductive heater) 850°C (Radiative heater)
5. Target Carousel	6 x 1" diameter or 3 x 2" diameter
6. Ion gun:	DC Kaufman-type - Size: 4 cm diameter - Beam Voltage: 1000 eV - Beam current: 100 mA - Ar pressure: ~ 0.5 mTorr - Flow rate: ~ 5 sccm - Incidence angle: 45°-55° with respect to substrate normal

RHEED data of biaxially Textured MgO films on amorphous $\text{Si}_3\text{N}_4/\text{Si}$.



Phi-scan data of YBCO films on biaxially textured YSZ templates



MgO: Ion incidence angle ~ 45° YSZ: Ion incidence angle ~ 55°

* 1 cm x 1 cm substrates sizes only

For further information, please contact: sales@neocera.com or +1-301-210-1010, ext 104