

Accelerator Upgrade: High resolution RBS and Triple Beam Facility

Capability/Need

- Significant improvement to EMSL's Accelerator Facility
 - High (depth) resolution Rutherford Backscatter (RBS) detector
 - Triple beam (ion, photon, and electron) radiation and characterization facility
 - Steady-state and time-resolved spectrofluorometer with 200- to 1900-nm wavelengths
 - Accelerator upgrade: High beam stability and dedicated beam lines for high resolution RBS and triple beam facility



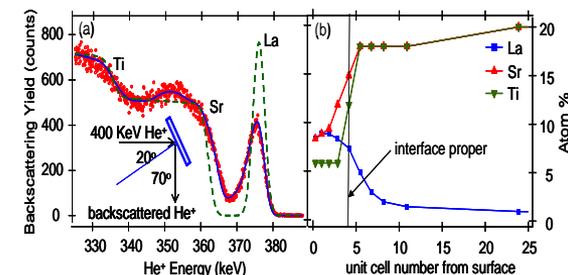
High resolution RBS Detector



Time Resolved Spectrofluorometer



Accelerator Upgrade



RBS Spectra

Depth Profiles

Science/Users

- Quantitative elemental analysis with high depth resolution (0.3 nm)
- Enhanced Buried Interface Characterization
- Fundamental scientific understanding of ion, electron and photon interactions in solids, relevant to radiation detectors and materials damage.
- Steady-state and time resolved fluorescence from UV-Vis to near infrared regions
- Insights into contaminant transport and fate, biological tracer studies

EMSL Strategy Alignment; Specifics

- Science themes: Geochemistry/Biogeochemistry and Subsurface Science; Science of Interfacial Phenomena; Biological Interactions/Dynamics
- Cross-cutting challenges: Static-Dynamics; Unprecedented Resolution; Design/Synthesis of Complex Materials
- EMSL capability area: Spectroscopy and Diffraction
- Anticipated availability: September 2010
- Technical POCs: Shuttha Shutthanandan, Yanwen Zhang