Properties of Oxide Interfaces: Benefits of Aberration Corrected TEM/STEM for Interface Analysis

Understanding interface properties has been one of the major topics for transmission electron microscopy for several decades. This interest is partially related to the high importance of thin films for microelectronic applications. The general trend has been and still is that structures are getting smaller, which has the effect that interface and surface properties are getting more important than bulk properties for the whole system. Furthermore there is a continuing effort to tailor bulk properties by nanostructuring.

This requires understanding interface structure and chemistry on an atomic scale. The instrumental capabilities of TEM have been improved significantly over the last decades and therefore the results from TEM based interface studies have equally improved and are getting closer to an ideal characterization which tells us the precise location, type and binding state of each atom adjacent to an interface. Aberration correction had a significant influence in improving interface analysis.

Examples of interface analyses and how aberration correction affects imaging and spectroscopy at interfaces, will be given. Expected future trends and development in the field of interface analysis will be discussed.

Department Contact Information
Anna Tucker  Anna.Tucker@utsa.edu
http://physics.utsa.edu