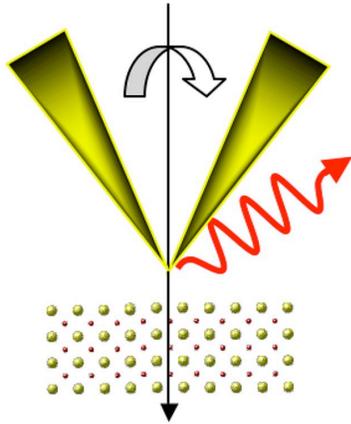


HARECXs Measurements of Atomic Scale Order/Disordering

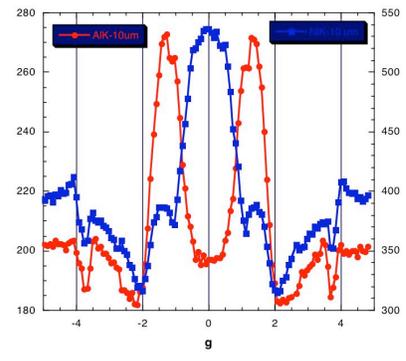
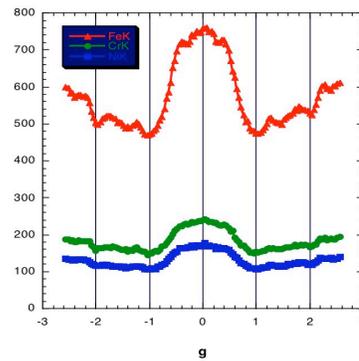
N.J.Zaluzec (ANL), K.L. Smith (ANSTO), S. Matsumura (Kyushu U.)



316 SS - Random Solid Solution

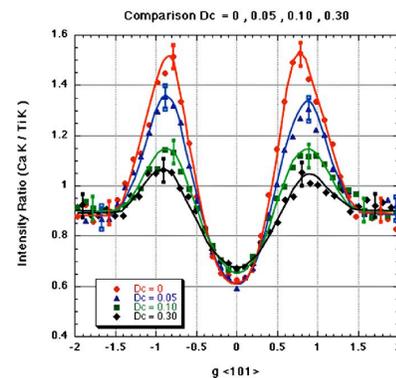
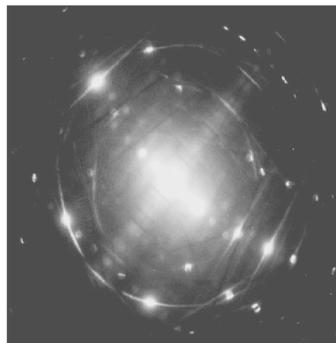
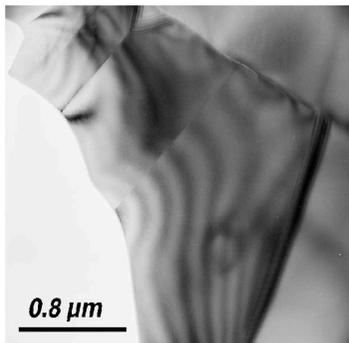
NiAl - Ordered Solid Solution

NiAl - Ordered Solid Solution

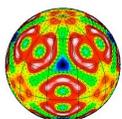


In High Angular Resolution Electron Channeling X-ray Spectroscopy (HARECXs) we use computationally mediated control to precisely tilt the incident electron probe in an Analytical Electron Microscope over a continuum of angles while monitoring the characteristic X-ray Emission

The orientation dependence of the Characteristic X-ray Emission is determined as a function of $\langle g \rangle$. This dependence is highly sensitive to structure particularly in ordered systems (right) when compared to random solid solutions (left).



By monitoring the change in the orientation dependence of the x-ray emission as function of disorder and as appropriate comparing the results to calculations we can determine the nature of elemental redistribution of individual atomic species, and the onset of disorder, well before diffraction or image effects can be observed. These studies are being applied to characterization of Oxide system of interest to both the Nuclear Waste Storage and Fusion Communities.



BES - DOE

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MSD - ANL

