Scientific comparison with simulated images is required. To determine the quality and the exact position of interfaces distinguished by the difference in mean intensity between the GaAs and AlAs images. The principal difficulty is that both the relevant information about the interface and the unwanted information about background contrast are non-periodic. Image processing techniques which can be used to extract the relevant information, and make comparison with calculated data possible, are investigated using both experimental and simulated images. Results indicate that, when carefully used, filters in reciprocal space can be applied to suppress background contrast while retaining (non-periodic) fine features in the lattice images. As a next step, correlation procedures can be applied to distinguish the differences in fine pattern between the different layers, and compare experimental and simulated images.

Alternatively, we distinguish the layers by differences in the fine pattern of GaAs and AlAs lattice images, typically imaged away from Scherzer defocus. To determine interface quality and position via this approach image processing is used. The principal difficulty is that both the relevant information about the interface and the unwanted information about background contrast are non-periodic. Image processing techniques which can be used to extract the relevant information, and make comparison with calculated data possible, are investigated using both experimental and simulated images. Results indicate that, when carefully used, filters in reciprocal space can be applied to suppress background contrast while retaining (non-periodic) fine features in the lattice images. As a next step, correlation procedures can be applied to distinguish the differences in fine pattern between the different layers, and compare experimental and simulated images.

14.4-5 NEW STRUCTURES OF ALICATI NIOMI TUNGSTEN OXIDES DERIVED BY HREM AND X-RAY POWDER DIFFRACTION. By M. Lundberg and M. Sundberg, Department of Inorganic Chemistry, Arrehnius Laboratory, University of Stockholm, Sweden.

A new tunnel structure of a fully oxidized compound with the general formula K_{1+x}Nb_{1}O_{3+y} (1 < x < 3) has been deduced from high resolution electron micrographs. For n = 2 the monoclinic unit cell parameters are a = 18.882(5), b = 3.9572(5), c = 12.378(2) Å, β = 102.931(3). The space group is P2/n. The structure is based on a framework built up of octahedra and pentagonal columns in such a way that four-, five-, and, six-sided tunnels are formed (Fig. 1). The structure comprises features of both the K_{1}O_{2/3} and the tetragonal tungsten bronze (TTB) structure types.

Phases obtained for values of n = 0, 1, and 2 possess structures with a tripled TTB unit cell, while preliminary HREM studies of the sample x = 1 reveal the existence of a new TTB-related phase with the composition K_{2}(Nb, W)_{10}O_{31}.