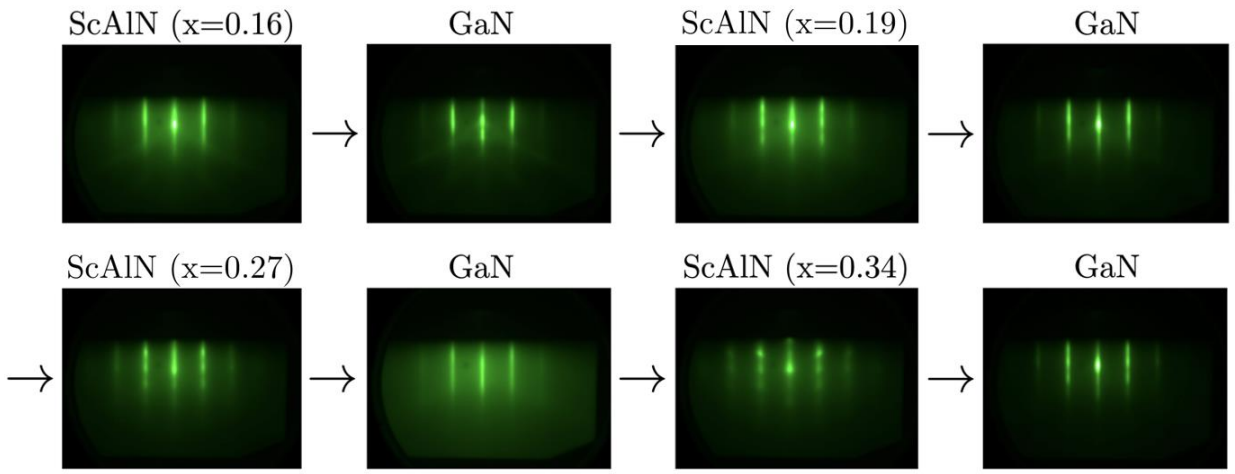

Fig. 1: Evolution of RHEED pattern along the <110> zone axis for the 4X period $Sc_xAl_{1-x}N$/GaN multilayer heterostructure. All diffraction images suggest the layers are epitaxial and single-crystalline. The GaN layers recover their 1x1 streaks and maintain their hexagonal crystal structure.

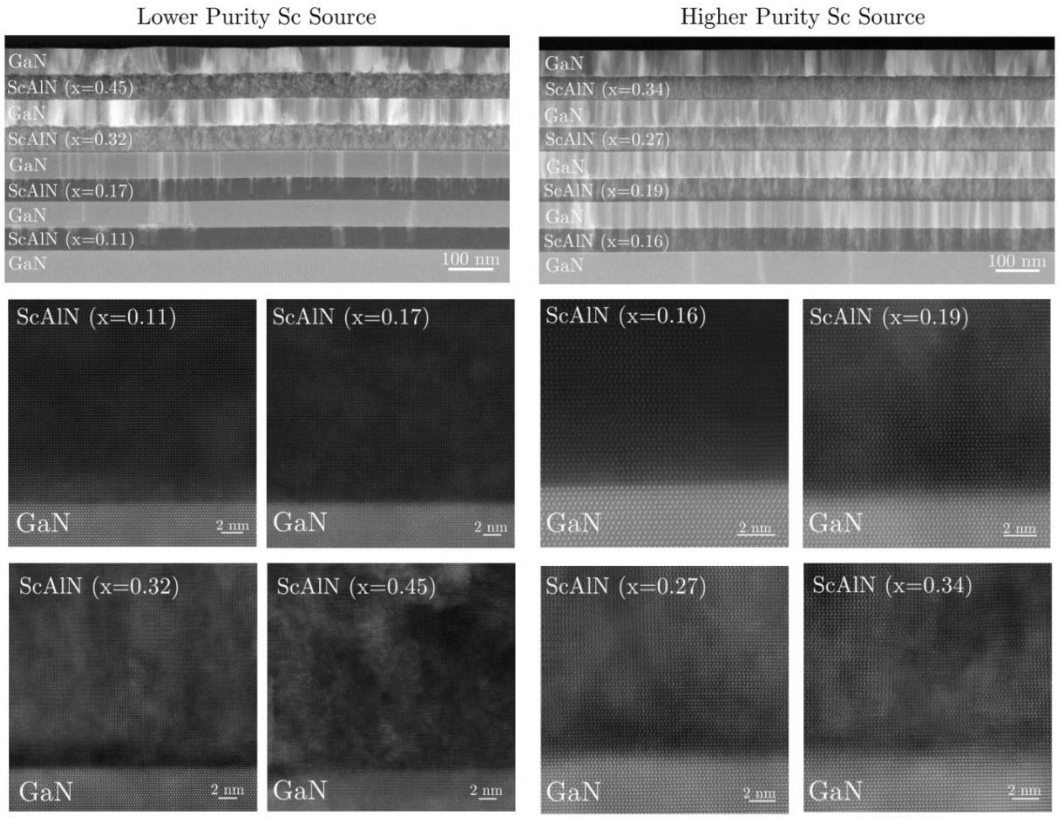

Fig. 3: STEM images of the heterostructures grown with lower purity Sc source (left) and higher purity Sc source (right). Increased defect densities are seen in the high Sc composition $Sc_xAl_{1-x}N$ layers for both samples grown with lower and higher purity Sc sources. Atomic resolution images near the interfaces are acquired with a shorter camera length for atomic number(Z)-dominant contrast between $Sc_xAl_{1-x}N$ layers and GaN. GaN is observed to be wurtzite in all layers.