Electronic Supplementary Material (ESI) for Nanoscale.
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Supplementary materials of "Low threading dislocation density and antiphase boundary free GaAs epitaxially grown on on-axis Si (001) substrates"

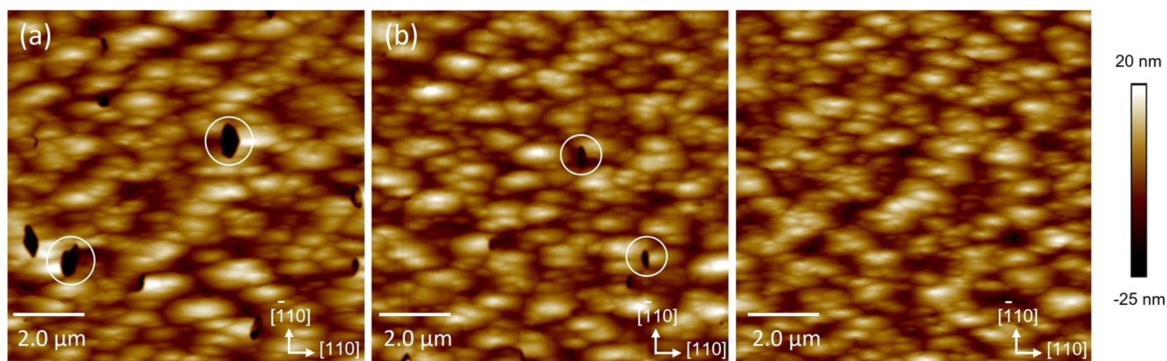

Figure S1. GaAs grew on the Si buffer layer with (a) one, (b) three, (c) five iterations of 20 nm Si grown at 850 °C and annealed at 1200 °C. The APBs are labelled with white circles.

Figure S1. illustrates the GaAs grown on the Si buffer layer with various iterations of thin Si layers. The structure of GaAs is shown in Figure 1. (b). Comparing Figure S1 (a) with (b), although APBs still exist, the density of APBs decreases with the increased number of iterations. A longer growth time and extra annealing steps help to achieve the realisation of a fully reconstructed Si surface with parallel Si S steps. Finally, an APB-free GaAs is demonstrated with five iterations of thin Si layers, as shown in Figure S1. (c).