

Figure 1. (a) Relative III and V fluxes in conventional continuous MBE growth (left) as compared to PSE-MBE flux (right)². Representative scanning electron microscope images of (b) non-selective and (c) selective GaAs growth¹ over SiO₂ structures.

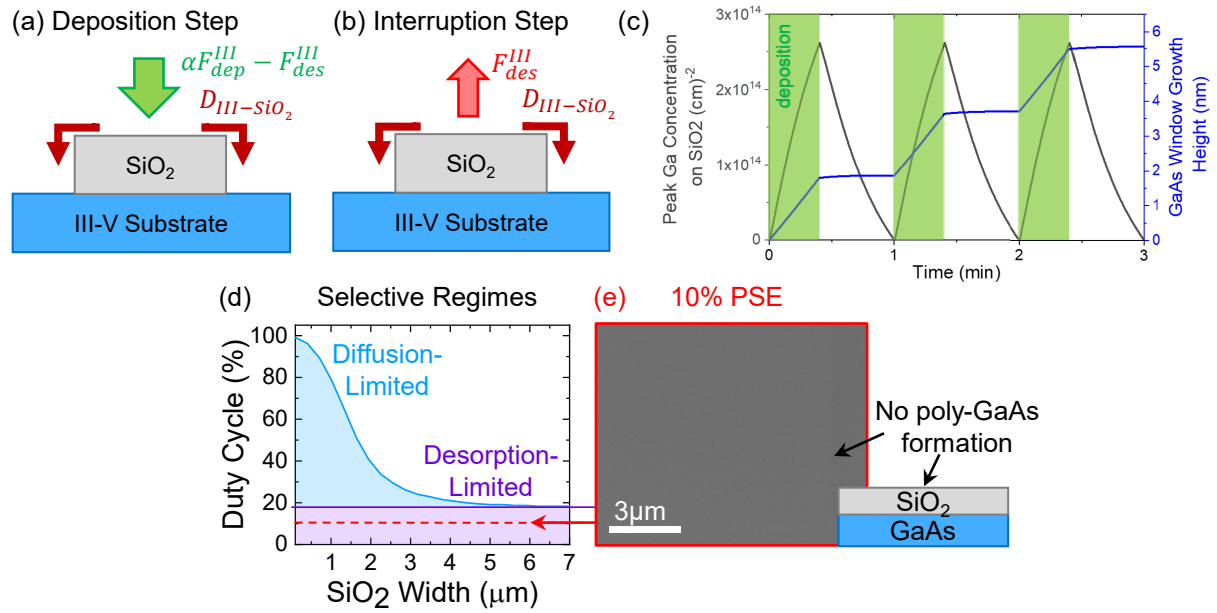


Figure 2. Diagrams of (a) deposition and (b) interruption steps in PSE highlighting the following mechanisms: adsorption (α), deposition (F_{dep}^{III}), desorption (F_{des}^{III}) and diffusion ($D_{III-siO_2}$). (c) Ga adatom concentration on SiO₂ and GaAs growth height simulated under the following conditions: 3 cycles of 40% PSE GaAs grown at 0.7A/s with 65× As₄/Ga ratio on a 2μm SiO₂ grating with 1μm GaAs windows. (d) Selectivity map identifying accessible PSE duty cycles for diffusion-limited and desorption-limited growth regimes. (e) Scanning electron microscope image of SiO₂ film after 100 nm of GaAs growth at 10% PSE; no polycrystal formation indicates a feature-independent growth regime.

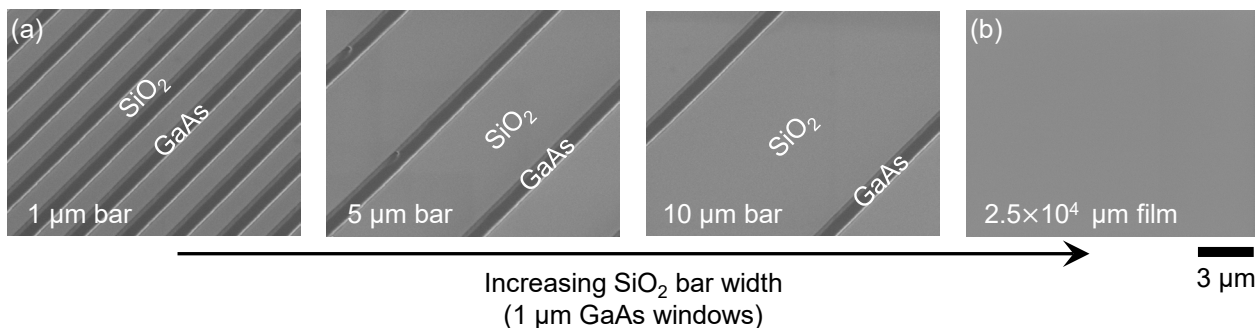


Figure 3. Scanning electron microscope (SEM) images demonstrate full feature-independence of the desorption-limited regime. (a) Silica gratings varying in bar width with 1μm GaAs windows and (b) silica film showing no polycrystal formation after 100 nm of 10% PSE growth of GaAs.