Supplementary information:

Determining Surface Recombination Probabilities during Plasma-enhanced ALD using Lateral High Aspect Ratio Structures

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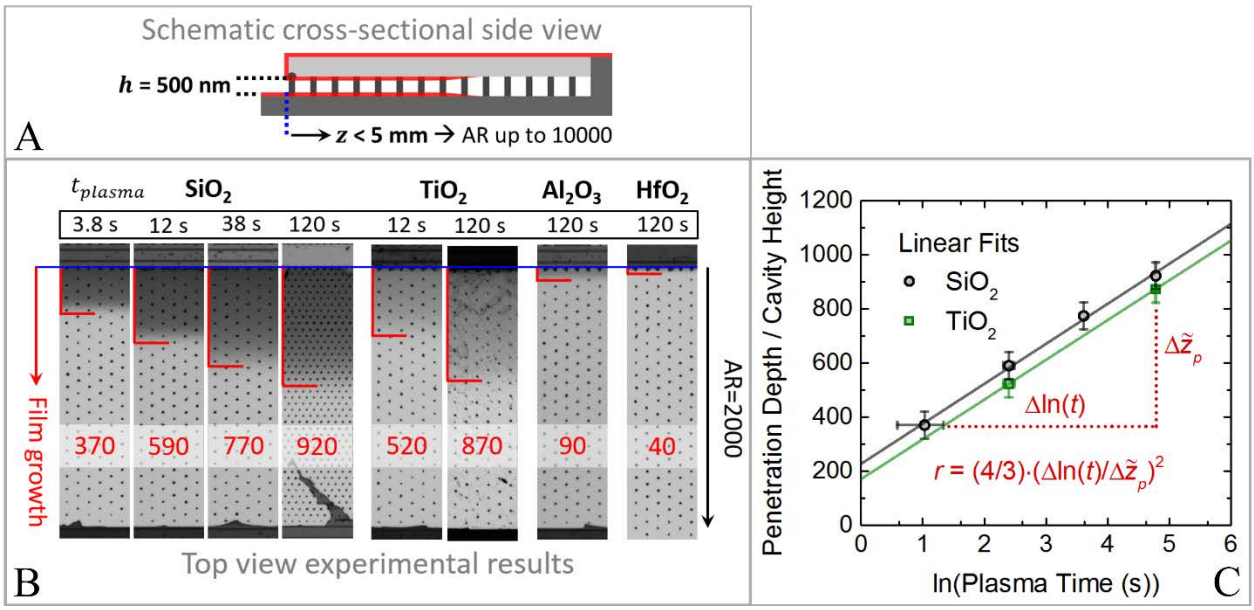

Figure S1: Panel **(A)** shows a schematic side view of a Lateral High Aspect Ratio (LHAR) structure (PillarHall® LHAR4) developed at VTT. Film growth on such an extremely high aspect ratio (AR) structure is typically limited up to a certain penetration depth. In the case of plasma-enhanced atomic layer deposition (ALD), the achieved penetration depth can provide the recombination probability *r* of the reactive plasma radicals on the growth surface. This is demonstrated in panel **(B)** and **(C)** for the recombination of O atoms on oxides. High penetration depths are observed for SiO_2 and TiO_2, with $r \sim 6 \cdot 10^{-5}$ fitted for both processes using the determined relation between the penetration depth and plasma exposure time. In contrast, plasma ALD of Al_2O_3 and HfO_2 reached AR~90 and AR~40, with *r* estimated at $(1\text{-}10) \cdot 10^{-3}$ and $(0.1\text{-}10) \cdot 10^{-2}$, respectively. These results show how our method can provide valuable insight into surface recombination of plasma radicals.