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TITLE: Towards atomically controlled growth and self-limiting processes.

ABSTRACT:

Devices fabricated from SiC/Si epitaxial wafers has shown to need surface passivation and insulating coatings which depends on the future applications, in order to provide electrical stability, to reduce reverse-current leakage and to increase breakdown voltage. For solar cell applications – and in Metal-Oxide-Semiconductor (MOS) systems – Al-oxide thin film coatings have some strong followers, not the least due to the recent considerable advances of the Atomic layer deposition (ALD) processes. In this talk it will discussed recent results obtained in atomically controlled, self-limiting procedures for growth of aluminum oxide on SiC-on-Si [1-4]. The SiC/Si was formed by a remote CH₄ plasma interacting with Si surfaces in UHV [1-3]. After growing the SiC/Si system a self-limiting Si-oxide layer was grown on the surface, with a thickness of around 1 nm. On top of this layer it is deposited approximately 1 nm of Al with a Knudsen atomic source and then reacted it thermally with the Si-oxide. All the process steps and the resulting structures of the layers and the interface were monitored, in-situ, using synchrotron radiation induced core level photoemission at ASTRID, Aarhus, Denmark.

References

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