

Abstract Submitted
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Progress on Voltage Waveform Tailoring for plasmas: From science to process, from lab to fab ERIK JOHNSON, LPICM-CNRS, Ecole Polytechnique, University Paris-Saclay, SEBASTIEN DINE, SOLAYL SAS, JEAN-PAUL BOOTH, LPP-CNRS, Ecole Polytechnique, University Paris-Saclay — The use of Tailored Voltage Waveforms for the excitation of asymmetric plasmas is a useful tool both for process control and to understand the physics behind surface treatments. It has unveiled knowledge about processes such as deposition, etch, surface passivation, cleaning, doping, and texturing. However, despite recent interest, any hope of a large-scale application of this technique by a risk-averse plasma-processing industry means a clear path to simple implementation must become obvious. The engineering challenges to using this technique come from its multi-frequency nature; one must couple multiple harmonics of an RF frequency efficiently, and precisely know their phase and amplitude when they interact with the plasma. Our group has focused on addressing the practical issues that risk slowing the adoption of this technique, namely (1) efficient and affordable power coupling, and (2) a straightforward technique for calibration. For power coupling, we have progressed on the concept of multi-frequency impedance matching, and I will discuss trade-offs in cost, complexity, and control. Concerning calibration (i.e. knowing the waveform that appears at the electrode), I will discuss our "minimally-intrusive" techniques to do so.

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