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Characterization and diagnostics of RF plasmas under manufacturing conditions MICHAEL KLICK, Plasmetrex GmbH — There are many problems in the industrial usage of plasma processes. For the semiconductor industry as one of the most important examples, there are the following main targets: chamber matching, minimizing the first wafer effect, optimizing chamber conditioning, fault detection and Fault classification, and pre-process impact. From the plasma science of view, the analysis of these effects leads often to problems as not well defined and basically unknown chamber wall state (varying heavily with product processed), chamber and gas heating affecting also the chamber wall state, plasma mode transitions (e.g., E-H-mode) and its detection. In the most of industrial environments, there is a permanent lack of information of the state of the plasma. What are potential solutions? 1. Simplified models where complex parts and unknown boundary conditions are replaced by parametrization through real-time and in-situ sensors. 2. Complementary real-time and in-situ plasma sensors. These ideas lead to some challenges which have to be discussed. Those are the requirement of characterization of the plasma close to the substrate and for manufacturing sites to have a basic knowledge of plasmas and minimum understanding or their own plasma processes.

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