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Modeling and Simulation of Plasma Enhanced Chemical Vapor Deposition AARON SMITH, DOMINIC BETT, MONISHA CUNNINGHAM, Claflin University, Orangeburg, SC, SUDIP SEN, Claflin University, College of William & Mary, National Institute of Aerospace — Plasma Enhanced Chemical Vapor Deposition (PECVD) is a process used to deposit thin films from a gas state (vapor) to a solid state on a substrate. Recent study from the X-ray diffraction spectra of $SnO2$ films deposited as a function of RF power apparently indicates that RF power is playing a stabilizing role and hence in the better deposition. The results show that the RF power results in smoother morphology, improved crystallinity, and lower sheet resistance value in the PECVD process. The PECVD processing allows deposition at lower temperatures, which is often critical in the manufacture of semiconductors. In this talk we will address two aspects of the problem, first to develop a model to study the mechanism of how the PECVD is effected by the RF power, and second to actually simulate the effect of RF power on PECVD. As the PECVD is a very important component of the plasma processing technology with many applications in the semiconductor technology and surface science, the research proposed here has the prospect to revolutionize the plasma processing technology through the stabilizing role of the RF power.

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