

Abstract Submitted
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Using LabVIEW for Complete Systems Control of an ECR Thin Film Deposition System.¹ BRANDON BENTZLEY, The College of New Jersey, ANDREW POST-ZWICKER, Princeton Plasma Physics Laboratory — ECR produces a high-density plasma maintainable at low pressure, typically 10^{-2} Torr, which increases ion directionality and mean free path, improving deposition rate and precision. The ECR deposition system requires that its gas flow control, magnets, 2.45 GHz source, and other components all work in concert. Operating the system requires a user to constantly compensate for the dynamics of the system, such as Argon gas pressure and magnetic field. This is an inconsistent method and requires the constant presence of an experienced operator. Using LabVIEW, all of the individual components of the ECR deposition system can be linked and ultimately automated. A single LabVIEW VI is being used to control microwave power, magnet current, target bias voltage, vacuum and compressed gas valve position, chamber pressure, and robotics commands. The VI takes many factors into account simultaneously such as chamber pressure, ion current and spectroscopic data in order to make decisions about the system state. The use of complete software control also reduces complex routines such as robotics and startup procedures to a mouse click. Details of the feedback based logic will be discussed further. Data on copper deposition rates, uniformity and spectroscopic data will also be presented.

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