

# Seminar

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## Institute for Plasma Research

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**Title :** Design and Development of Power Supply for Solid State Power Amplifier

**Speaker:** Mr. Rohit Agarwal

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**Date :** 3rd February 2020 (Monday)

**Time :** 02:30 PM

**Venue :** Committee Room 3, (New Building), IPR

### **Abstract :**

A constant voltage and variable current power supply is required for Solid State RF Power Amplifier (SSPA). The RF power requirement of SSPA varies from a few watts to 12 kilowatts depending on RF application. A possibility exists in regulated power supply that it may enter in discontinuous conduction mode during low load condition. This causes the controller to behave unexpectedly leading to increase in the output voltage ripple. A possible solution to overcome this problem is Hysteresis feedback control scheme. This control scheme can work in both discontinuous and continuous conduction modes. The advantages and challenges involved with hysteresis control will be discussed here.

A prototype regulated DC power supply in the range of 30V to 65V, 10 A having two parallel modules is designed and developed for this application. The selected topology has twelve pulse rectifier followed by interphase transformer and synchronous buck converter to get desired output voltage. Modular design is selected to improve the reliability and redundancy of the system.

Testing for this power supply is done at different voltage and current levels to analyze the steady state, transient and dynamic response of the power supply. Design verification is done using PSIM software. Experimental and simulation results are in good agreement.

Success of this prototype will lead to development of a power supply of 30V- 65V/ 320A, necessary for SSPA.

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