

Seminar

Institute for Plasma Research

Title : To Design, Analyse and Develop Resonant Converter based DC power supply for the pre-driver stage amplifier

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Date : 17th September 2018 (Monday)

Time : 11.00 AM

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

Abstract :

This Thesis mainly focuses on study, design and development of resonant converter based DC biasing power supply for tetrode RF tube. Zero Voltage Switching scheme has been adopted for developing the power supply, simulation was carried out using PSIM software. The Control grid of RF tube needs a negative biased DC power supply which would be operating in three modes of operation namely viz. (i). Cut off mode (-500V, 4A), (ii). Conduction mode with no RF power extraction (-350V, 2.8A) and (iii). Conduction mode with RF power extraction (-350V, 500mA to 2.8A). Depending upon the application, it needs to fulfill the requirement of constant voltage variable current when operating in conduction mode with RF application. A 500V, 4A modular DC power supply has been developed and tested on resistive load; it has four modules of 125V, 4A, each connected in series to obtain 500V at the output with 1% ripple factor (peak to peak). The power circuit of each module consists of 6 pulse rectifier unit with DC link capacitor followed by resonant buck converter with switching frequency of the IGBT switch is of the order of 20 kHz. Four secondaries transformer with the winding configuration of star-delta has been used to feed the 6 pulse rectifier unit so as to achieve low ripple value in the output voltage. L-C filter at the output side has been used to serve as the filtering requirement.
