

## Session 9. Systems / Power supply

April 29 (Monday) / 16:30 ~ 17:50 / Room 3

Session Chair: Michael Kempkes (Diversified Technologies, Inc., USA)

16:30 ~ 16:50

### 9.1 / [Keynote] Development of a Solid State Pulsed Power Supply IGBT Modulator for Gyrotron TWT

Youlei Pu (University of Electronic Science and Technology of China, China), Zewei Wu (University of Electronic Science and Technology of China, China), Junqian Jin (University of Electronic Science and Technology of China, China), guo liu (University of Electronic Science and Technology of China, China), wei jiang (University of Electronic Science and Technology of China, China), zhigang lu (University of Electronic Science and Technology of China, China), Yong luo (University of Electronic Science and Technology of China, China)

This paper describes the development of a solid state pulsed power supply (SSPPS) IGBT Switch for high power millimeter wave gyrotron. The modulator is made up of seriesconnected insulated gate bipolar transistor (SC-IGBT). Finally, the developed IGBT Modulator can output the pulse with the maximum repetition rate is 10-kHz and the pulse width from 5 $\mu$ s to DC, the amplitude of the output can be adjusted from 0 to 60 kV.

16:50 ~ 17:10

### 9.2 / Integrated Klystron Test Stand

Marcel P.J. Gaudreau P.E. (Diversified Technologies, Inc., USA), Luan Jashari (Diversified Technologies, Inc., USA), Michael Kempkes (Diversified Technologies, Inc., USA), Rebecca Simpson (Diversified Technologies, Inc., USA)

Diversified Technologies, Inc. (DTI) recently delivered an Integrated Klystron Test Stand for klystrons under development at the Naval Research Laboratory (NRL) and Communication and Power Industries, Inc. (CPI). The test stand provides an HV beam and depressed collector power supplies, mod-anode modulator, controls, and circuit /klystron protection. The Integrated Klystron Test Stand simplifies and speeds the ability of the user to safely and efficiently test and exercise the klystron over the full range of its capabilities.

17:10 ~ 17:30

### 9.3 / HV Solid State Series Switch 18kV/50A: Technology Demonstrator for ESS Spoke RF Power Station

Rutambhara Yogi (European Spallation Source, Sweden), Carlos Martins (European Spallation Source, Sweden), Petro Pohorilo (European Spallation Source, Sweden), Matthew Bergstrom

(European Spallation Source, Sweden)

The European Spallation Source (ESS) will be the world's most powerful pulsed neutron source by the end of the decade, which will accelerate a beam of protons with a beam current 62.5 mA to 2 GeV. The beam pulse width is 2.86 ms long and pulse repetition frequency is 14 Hz. The acceleration will be provided by 155 cavities, out of which 97 % of the cavities are superconducting. The first section of the ESS superconducting linac is Spoke linac consisting of 26 spoke cavities resonant at 352 MHz.

The maximum power requirement for ESS spoke RF power station is 400kW. It will be achieved by combining the output of two tetrode TH595 amplifiers. The two tetrodes are powered by a single anode power supply. Instead of standard crow-bar protection, a single series switch will be used to protect the two tetrodes. Such series switch was developed for ESS.

The present paper discusses the selection of series switch over the crow-bar and the first test results of the technology demonstrator HV series switch.

17:30 ~ 17:50

#### 9.4 / Ku-Band Dual TWTs Pulsed MPM for Space Application

Weibo Huang (China Academy of Space Technology (Xi'an), China), Hui Li (China Academy of Space Technology (Xi'an), China), Qianwen Chen (China Academy of Space Technology (Xi'an), China), Bin Zhou (China Academy of Space Technology (Xi'an), China), Bib He (China Academy of Space Technology (Xi'an), China), Depeng Bai (China Academy of Space Technology (Xi'an), China)

The advances to MPM is introduced. A compact Microwave Power Module (MPM) for Space application is presented which consists of an electronic power conditioner (EPC), two solid-state power amplifiers (SSPA) and two short travelling wave tubes (TWT). The EPC and SSPA are assembled together with these two TWTs in one housing. The MPM weight less than 7kg is capable of providing output power over 500W with 45% efficiency in 15% duty cycle. The Phase Coherence of it is less than 5degree.