

Session 6. MBKs

April 29 (Monday) / 13:30 ~ 15:10 / Room 3

Session Chair: Sung-Ju Park (Pohang Accelerator Laboratory, Korea)

13:30 ~ 13:50

6.1 / Thermal simulation of a Multiple Beam Electron gun for Ku-Band Klystron

Ayan Kumar Bandyopadhyay (CSIR-CEERI, India), Raktim Guha (CSIR-CEERI, India), Debasish Pal (CSIR-CEERI, India), Atmakuru Nagaraju (CSIR-CEERI, India), Rajendra Sharma (CSIR-CEERI, India)

This article reports thermal analysis of a multiple beam electron gun for a Ku band multiple beam klystron. Thermal analysis of the electron gun has been carried out to estimate temperature distribution at different parts of the electron gun including each individual emission button. It is necessary to have uniform temperature distribution among the emission buttons to ensure uniform electron emission. The electrode and support structure and joints have been optimized to minimize thermal drain in hot condition. Estimation of the thermal deformations in the cathode geometry and the operating power have also been done.

13:50 ~ 14:10

6.2 / On filter system tuning of wideband multibeam klystron with high-mode double-gap output cavity

Anatoly Galdetskiy (JSC "RPC "Istok" named after Shokin", Russia), Nikita Golovanov (JSC "RPC "Istok" named after Shokin", Russia), Serguey Scherbakov (JSC "RPC "Istok" named after Shokin", Russia)

A new tuning technique for klystron output filter system is considered. It is based on comparison of partial frequencies of 3D model and optimized LC prototype of output cavity system. The use of double-gap active cavity and tripletuned filter system makes possible significant increasing of bandwidth. The results of simulation and tuning of output filter system for multibeam X-band klystron with double-gap active cavity operating on third mode are presented.

14:10 ~ 14:30

6.3 / Simulation of collector induced voltage in high-power multiple-beam klystron

Alexander N. Darmaev (JSC "RPE "Toriy". Russia), Dmitry A. Komarov (JSC "RPE "Toriy", Russia), Yury N. Paramonov (JSC "RPE "Toriy", Russia), Denis A. Kalashnikov (JSC "RPE "Toriy", Russia)

The paper deals with the effect of external electrical circuits on the conditions in high-power multiple-beam klystron collectors. A mathematical model describing the induced voltage on the

collector of the O-type devices with allowance for external electrical circuits taking into account the electric field distribution is presented. The possibility of reducing the collector induced voltage when using external capacitive elements and new collector design is shown.

14:30 ~ 14:50

6.4 / S-Band Wideband Multi-Beam Klystron with Reversed Permanent Magnet Focusing and High Average Power

Li Ye (Beijing Vacuum Electronics Research Institute, China), Li Dong-feng (Beijing Vacuum Electronic Research Institute, China), Yang Lu-xuan (Beijing Vacuum Electronic Research Institute, China), Zuo Haibo (Beijing Vacuum Electronic Research Institute, China), Wang Zi-wei (Beijing Vacuum Electronic Research Institute, China)

This paper presents a new developed S-Band Wideband High-Power Multi-Beam Klystron (MBK). The tube is focused by reversed permanent magnet with a relative wideband over 13.6%. The average output power is over 20kW and the weight is only 34kg, which is easy for equipment dismantling and assembling. This MBK index is the highest in China at present.

14:50 ~ 15:10

6.5 / [Keynote] 6 kW L-band pulsed MBK with broad frequency band of 15%

Igor Guzilov (JSC, Vacuum device's basic technologies, Russia)

L-band MBK with frequency band of 15% and output power of 6kW that employs the new technology of decreasing cavity sizes was designed at VDBT. Two samples of MBK were fabricated and successively tested. The diameter of MBK is no more than a half of wavelength.