38th INTERNATIONAL CONFERENCE ON HIGH ENERGY PHYSICS
AUGUST 3 - 10, 2016
CHICAGO

Contribution ID: **1456** Type: **Poster**

Phase and Power Control in Magnetron Transmitters for Superconducting Accelerators

Saturday 6 August 2016 18:00 (2 hours)

This report describes requirements for phase and power control in the high-power magnetron transmitters allowing the suppression of parasitic phase and amplitude modulations in the Superconducting RF (SRF) cavities of accelerators. The modulations are caused by microphonics, Lorentz Force detuning (LFD), dynamic tuning errors, beam loading, etc. The methods of control in magnetron transmitters allowing the required dynamic phase and power management of magnetrons based on theory of the charge drift in magnetrons and results of the experimental study of the control are considered and discussed.

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Session Classification: Poster Session

Track Classification: Accelerator: Physics, Performance, R&D and Future Accelerator Facilities