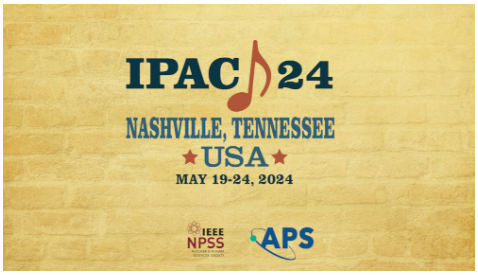

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APS storage ring waveguide layout study for solid state amplifier upgrade

Wednesday, 22 May 2024 16:00 (2 hours)

Currently, radiofrequency (RF) power to the Argonne Advanced Photon Source (APS) storage ring and Booster cavities is provided by several klystrons. APS is in the process of replacing the storage ring klystrons with clusters of 160 kW solid state amplifier (SSA) gradually. It is required to keep most of the existing equipment racks, klystrons and cable trays for smooth operation and transition until the SSA upgrade commissioning. The replaced klystrons may be kept for future RF power backup to the sectors waiting for SSA upgrade. The following post challenges to the waveguide installation: confined space of the waveguide lines removal and installation, finding space for additional new equipment racks, SSA racks, power combiners, AC power distribution, water cooling systems and new cable trays. The goal of this study is to generate a new waveguide layout design with enough space clearance for installation, operation, repairing of SSA plus AC distribution, water cooling system and all safety requirements. This work presents the study of waveguide lines layout modification for storage ring cavities and the result of this study will be a guideline of waveguide construction for APS storage ring SSA upgrade as well as the installation of the system. A discussion of waveguide combiner vs. coax combiner is also presented.

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