

## Klystron Amplifier for Short X-ray Pulse Prototype and Test Set\*

*Wednesday 5 May 2010 14:00 (30 minutes)*

The proposed baseline design for the addition of short X-ray pulses at a sector of the Advanced Photon Source (APS) storage ring called for 20 superconducting deflecting cavities, each excited with 5 kW cw at 2815.5 MHz, which is the 8th harmonic of the storage ring frequency. A klystron amplifier has been designed based on a best effort, reduced power, engineering sample tube. The initial use of the first amplifier is to support developmental cavity testing. However, the amplifier was designed as an advance prototype for final power amplifiers, using a version of the same klystron that includes an upgrade to meet the full power requirement needed to support operation in the APS storage ring. Power supply-induced residual phase modulation could easily prevent meeting the severe phase tracking requirements. Therefore, a state-of-the-art, extra-low-ripple, high-voltage power supply is incorporated into the amplifier design. The requirements, design, construction, and results from initial turn-on are discussed.

- Work supported by the U.S. Department of Energy, Office of Science, Office of Basic Energy Sciences, under Contract No. DE-AC02-06CH11357

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**Session Classification:** Tubes & HVPS contd.