HIGH-POWER RF SOURCES

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Abstract

Vacuum electron devices continue to play a major role in most high-power RF accelerator systems. They provide continuous wave power to megawatt levels and pulsed power to hundreds of megawatts, at frequencies ranging from HF to millimeter wave. Power grid tubes, Tetrodes, are used for high-power accelerators operating in the HF and VHF frequency bands. Klystrons, multiple-beam klystrons (MBKs) and inductive output tubes (IOTs) take over as the amplifier-of-choice above 300 MHz, while a number of low-power systems utilize magnetron oscillators. A shift in technology, from klystrons to IOTs, has begun for many systems in the 300 MHz to 1500 MHz frequency range due to the IOTs improved efficiency and linearity. In the frequency range from 2.8 GHz to 18 GHz the klystron is king. In the millimeter frequency range gyro-klystrons are available. These technologies will be described, and developments and future trends discussed.

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