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Improved Collector Sweeping for Megawatt Gyrotrons[1] I.A. GORELOV, K. KAJIWARA, JOHN LOHR, D. PONCE, R.W. CALLIS, General Atomics — Failure of the collectors on several high power gyrotrons in the DIII-D installation due to cyclic fatigue has prompted a study of power loading in the collectors. Thermal analysis showed that power loading needed to be reduced to below 600 W/cm^2 from the previous limit of 1 kW/cm^2 to obtain acceptable service life. Remedial measures taken to reduce the loading included use of stronger sweeping of the spent electron beam in the collector, raising the beam to reduce the footprint, use of a sawtooth waveform for the sweep coil current to reduce the dwell at extremes of the sweep, increasing the sweep frequency and tightening the rf dropout interlock window. With these measures in place, the target power loading is met and the predicted service lifetime exceeds 50,000 pulses 5 s in length.

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