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Tuesday Afternoon - June 4, 1996
3:00 p.m. - Georgian Room
Oral Session 4B: 2.1 Intense Beam Microwaves
Chair: E. Schamiloglu

4B01

PULSE SHORTENING IN HIGH POWER MICROWAVE SOURCES

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We review the current state of understanding of the universal phenomena that high power microwave pulses are shorter than the applied electrical pulse. Higher power reduces pulse duration, limiting present-day sources to a few hundred joules. Is this limitation fundamental, or are there means to avoid it entirely? There is no reason to think that only one mechanism is responsible. Rather, there are layers of effects which may need to be addressed separately. We categorize experimental observations in terms of candidate pulse shortening mechanisms such as gap closure, primary and secondary electron bombardment of walls, and RF breakdown. Pulse shortening mechanism theory (microwave field interaction with the beam, resistive filamentation, enhanced closure, etc.) is summarized and compared to observations. We make suggestions for additional experiments and diagnostics to help separate out causes. Finally, means of reducing or eliminating pulse shortening are reviewed.

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