

Computer Simulations of Inductive Output Tubes,
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Tube (IOT) differs from a klystron in several aspects which
require special treatment in computer simulations. The
MAFIA TS2/TS3 codes have been extended accordingly:
The port approximation allows the simultaneous excitation
of several modes and the interaction of the bunch with a
higher order mode is possible. For the calculation of the
gated emission gun, several new features have been added:
to save CPU-time, the time step for the particle path
integration is allowed to be a multiple of the field calculation
time step, if particles are very slow (speed much lower than
c). The space charge limited cathode current may be
calculated in a quasi-static mode for fixed potentials. This
includes finite thermal initial velocity as well as the varying
influence of the anode field on the cathode. Alternatively, it
can be calculated in time domain for a given RF voltage
pulse between cathode and grid including RF beam loading
effects. The unphysical loading of the grid by intercepted
electrons is suppressed algorithmically.

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