

**HIGH REPETITION RATE OPERATION
OF THE ARLETRON -
DESIGN OF A TUNABLE POST-ACCELERATED
DEVICE**

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The Arletron is a compact microwave tube which has been designed with the code MAGIC ¹. Last year, we presented at the ICOPS conference the first experimental results in single shot operation. We have recently tested the Arletron at 100 Hz during 1 s, which is the limit of our power supply at CEA/CESTA ². We present here the main results of this experiment and new simulations.

The electron beam power could be increased by adding a post accelerating section downstream from the buncher, as in a Reltron, in order to increase the emitted power. The Arletron is as efficient as the Reltron or the BWO. High repetition rate operation is no longer limited by foils or grids, which are the drawback of a Reltron. Nevertheless, it has the disadvantage of needing a magnet but, for frequencies around 3 GHz, permanent magnets could be used to produce the low magnetic field necessary for beam propagation. The Arletron is a compact high repetition rate tube which can efficiently compete with the above-mentioned devices, in particular between 2 and 5 GHz. Its tunability has been studied with MAGIC and the results are presented here.

1. J. Gardelle, "The Arletron: an annular buncher for high repetition rate HPM operation " IEEE Transactions on Plasma Science 37 (2009), 1225.
2. J. Gardelle, L. Courtois, P. Modin, "High Repetition Rate Operation of a Compact Buncher for Microwaves", to be published in IEEE Transactions on Plasma Science.