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THE DELAY-LINE VOLTAGE MULTIPLIER

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Résumé. — On décrit un nouveau type de circuit pour produire des tensions élevées par multiplication de tension.

Abstract. — A new circuit for very high voltage production by voltage multiplication is described.

A new circuit for EHV production by voltage multiplication is now under test. The charging column is built to be electrically a band-pass delay line, whose discrete elements are tightly coupled resonant circuits. The capacitors are built in form of corona shields to allow good insulation with a very compact, self-supporting structure. A large amount of RF energy can propagate along the structure from the ground side up to the HV head. One or two diodes per stage allow half-wave or full-wave rectification. A 40 kV model has been tested in 1976, and a 300 kV section is being built presently in our laboratory.

The advantages of the new structure are:

- 1) High current capability.
- 2) Low stored energy in the multiplier capacitors (less than 200 $\mu\text{J}/\text{kV}$ at atmospheric pressure).
- 3) Large power available at the HV terminal, and at intermediate voltages for focusing, and pumping stations.
- 4) Easy transmission of signals to and from the head by a modulated carrier.
- 5) The structure is very compact, and does not waste additional room within the pressure tank, as compared with the parallel-fed Cockroft-Walton multiplier.
- 6) The structure allows the use of field shields at intermediate voltage for very high voltage generators.