

Linac4 H⁻ Ion Sources

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CERN's 160 MeV H⁻ linear accelerator (Linac4) is a key constituent of the injector chain upgrade of the Large Hadron Collider (LHC) that is being installed and commissioned. A cesiated surface ion source prototype is being tested and has delivered a beam intensity of 45 mA within an emittance of 0.3 π -mm-mrad. The optimum ratio of the co-extracted electron-to ion-current is below 1 and the best production efficiency, defined as the ratio of the beam current to the 2 MHz RF-power transmitted to the plasma, reached 1.1 mA/kW. The H⁻ source prototype and the first tests of the new ion source optics, electron-dump and front end developed to minimize the beam emittance are presented. A temperature regulated magnetron H⁻ source developed by the Brookhaven National Laboratory (BNL) was built at CERN and a two stage extraction is being produced. The first tests of the magnetron operated at 0.8 Hz repetition rate are described.