

A dc Proton Injector for Use in High-Current CW Linacs*, J. BOLME, L. HANSBOROUGH, T. HARDEK, D. HODGKINS, E. MEYER, C. ROSE, J.D. SCHNEIDER, J.D. SHERMAN, H.V. SMITH, JR., M. STETTLER, R.R. STEVENS, JR., M. THUOT, T. ZAUGG, LANL, Los Alamos, NM; A. ARVIN, M. RICHARDS SRS, AIKEN, SC; J. KAMPERSCHROER, General Atomics, San Diego, CA; P. BALLEYGUIER, CEA-BRUYERES LE CHATEL; R. FERDINAND, CEA-SACLAY - A 75-keV dc and pulsed mode proton injector is being developed for beam testing of a 100-mA, CW 6.7-MeV radio frequency quadrupole (RFQ) at Los Alamos. A microwave proton source operating at 2.45 GHz produces 130-mA hydrogen-ion beam currents with >85% proton fraction yielding the 110-mA proton current required at the RFQ injection point. Recent work on the proton source has shown the discharge may be pulsed by current modulation of the magnetron power supply. A 1-MHz coherent oscillation observed in the extracted ion beam was eliminated by selecting proper magnetron operation. Transport and matching of the proton beam to the RFQ is accomplished by a two-solenoid, beam space-charge neutralized low-energy beam transport (LEBT) system. The injector has now been temporarily reconfigured to operate at 50 keV and 90 mA for injector matching studies into a 1.25 MeV CW RFQ obtained from Chalk River Laboratories [1].

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- [1] J. David Schneider, et. al., "Installation of a CW Radio Frequency Quadrupole Accelerator at Los Alamos National Laboratory", Proc. of the 1994 International Linac Conference, August 21-26, 1994, (Tsukuba, Japan), p. 149.