

**A Hybrid Laser-Driven E-beam Injector Using Photo-cathode Electron Gun and Superconducting Cavity\***, C.E. CHEN, R.L. GENG, L.F. WANG,

B.C. ZHANG, K. ZHAO, IHIP, Peking University - A laser driven photocathode electron gun capable of producing pulsed electron beams of 100 Kev with a duration of 35 ps. was constructed as a continuous effort towards a high brightness superconducting RF injector. Various species of photo-cathodes can be obtained either by ion implantation, CVD or ion enhanced deposition in the preparation chamber attached to the injector. A number of photocathodes were tested in the light of enhancing the compatibility with the Nb cavity. At the same period, two China made Nb cavities were successfully constructed and tested. As the next step, a hybrid photo injector, using a DC laser-driven electron gun and one ( $\beta < 1$ ) plus three ( $\beta = 1$ ) superconducting cavities operating under 2 K is to be constructed. The design of the hybrid injector and possible production of the polarized electron beam from it are also discussed.

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