

Experimental Studies on the Acceleration of Positive & Negative Ions with a Heavy Ion ISR RFQ, C.E. CHEN, J.X. FANG, W.G. LI, X.T. REN, J.X. YU, IHIP, Peking University - With a 26 MHz water cooled Integrated Split Ring (ISR) RFQ, N⁺ beam was accelerated to more than 300 Kev at Peking University. Experimental studies on the acceleration of positive and negative Oxygen ions have also been carried out and the operating parameters were optimized respectively. Feasibility study of accelerating both positive and negative ion beam simultaneously in the same RFQ is also included. The latter has the merit of compensating the space charge both in the process of beam injection as well as on the target. Based on the experiences of the above, a high duty factor 90 MHz RFQ has been designed for ion implantation of 1 Mev Oxygen ions. The cavity parameters are optimized according to the dynamics study with PARMTEQ and MAFIA as well as to the experimental results obtained with model measurements.

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