

Feasibility Study on Superconducting System for Intense CW Ion Linac, S. KAWATSU, T. OTA, Y. TANABE, A. YAMAGUCHI, Toshiba Co.; A. MIYAHARA, Teikyo Univ. - An intense proton or deuterium cw beam has been required for irradiation tests of materials for future fusion devices and transmutation of nuclear waste. For such cw machines, a superconducting (s/c) system is considered to be intrinsically suitable because of its superior temperature stability and absence of electric losses. The system which consists of s/c cavities and s/c quadrupole magnets is presented in this paper. The niobium s/c cavity is a $\lambda/2$ coaxial type with two gaps and has a large bore radius in order to avoid the severe problem of beam spill. For accelerating the low velocity ions as efficient as possible, optimization of the cavity configuration is carried out by using the MAFIA code. The s/c quad. magnet with a saturated iron core is also three dimensionally analysed. Moreover, heat load at 4.2 K is estimated to investigate the LHe cryogenic system. As a result, it is shown that construction of the proposed system is feasible by existing technology, while intensive R&D efforts are, of course, inevitable.