

Beam Transmission Efficiency Study at RIKEN RFQ Linac, Y. BATYGIN, A. GOTO, O. KAMIGAITO and Y. YANO, RIKEN - Beam dynamics study in an RFQ linac using 3D particle-in-cell code BEAMPATH was performed to analyse beam parameters due to variation of RFQ field. The study shows that linear approximation of RFQ parameters adopted in PARMTEQ code along every cell requires correct treatment of vane cutting in order to reproduce the original PARMTEQ design. Our RFQ layout has non-adiabatically changing region from buncher to accelerating section. For that we noticed that inappropriate treatment of PARMTEQ design can provide mismatching of the beam with the channel and particle loss. Among the linearly varied functions of aperture and electrode modulation along every cell we choose the pair of that parameters which represent the initial PARMTEQ design in the most appropriate way. Final selection of RFQ structure is characterized by stable values of beam transmission efficiency (around 90%) both for zero-current mode and for space charge dominated regime. Effect of vane errors on beam parameters was studied as well to define the engineering tolerance for RFQ vane machining and alignment .