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Preliminary study of beam dynamics for SDTL-Based 200 MeV energy upgrade of KOMAC proton linac

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Korea Multipurpose Accelerator Complex (KOMAC) proposes an energy upgrade of the 100 MeV proton linac. The design of the extended linac is based on a normal-conducting separated-DTL (SDTL) structure which has several advantages over other accelerating structures. The SDTL structure is the same as the DTL, however, unlike the general DTL, the quadrupole magnet is not placed inside the DT but is placed outside. This adds more flexibility to optimize the DT structure for better accelerating efficiency. In addition, since only 4 DTs are placed in the SDTL tank, a separated field gradient stabilization device is not needed, so it is known to be easier to manufacture and align than the general DTL. Our upgrade design consists of a beam matching section between the SDTL and the existing DTL, and 20 SDTL tanks each containing four drift tubes (DTs) with a doublet focusing lattice structure. Beam dynamics simulations were performed using an optimized DT structure to accelerate proton beams from 100 to 200 MeV. We report the preliminary beam dynamics study of the 200 MeV SDTL linac carried out at KOMAC.

Footnotes

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Region represented

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Author: LEE, Seunghyun (Korea Multi-purpose Accelerator Complex)

Co-authors: PARK, Sungbin (Korea Multi-purpose Accelerator Complex); KIM, Han-Sung (Korea Atomic Energy Research Institute); KWON, Hyeok-Jung (Korea Multi-purpose Accelerator Complex)

Presenter: LEE, Seunghyun (Korea Multi-purpose Accelerator Complex)

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