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Beam dynamics design for a proton Linac for a compact accelerator based neutron source

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A prototype Canadian compact accelerator-driven neutron source (PC-CANS) is proposed for installation at the University of Windsor. The source is based on a high-intensity compact proton RF accelerator that delivers an average current of 10 mA of protons at 10 MeV to the target. This study can serve as a basis for the design of an initial stage of a new high-intensity compact accelerator-driven neutron source (CANS). The accelerator consists of a short radio frequency quadrupole (RFQ), followed by an efficient drift tube linac (DTL) structure. Different variants of DTL were investigated for our studies. APF, KONUS, CH-DTL, and Alvarez DTL as normal conducting cavities with a frequency of 352.2 MHz and a superconducting cavity with a lower frequency of 176.1 MHz were considered in our Linac design. Details of the beam dynamics of the RFQ and different types of DTL are presented in this paper.

Footnotes

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Primary author: ABBASLOU, Mina (TRIUMF)

Co-authors: MARCHETTO, Marco (TRIUMF); KOLB, Philipp (TRIUMF); LAXDAL, Robert (TRIUMF); JUNGINGER, Tobias (TRIUMF)

Presenter: ABBASLOU, Mina (TRIUMF)

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