

Beam Dynamics Design for Alternating Phase Focusing Proton LINAC for a Compact Accelerator Based Neutron Source

Tuesday, 25 February 2025 16:28 (1 minute)

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. An Alternating Phase Focusing (APF), KONUS, CH-DTL, and Alvarez DTL as normal conducting cavities with a frequency of 352.2 MHz were considered in our Linac design. Details of the beam dynamics of an Alternating Phase Focusing (APF) DTL are presented in this paper.

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Funding Agency

Abstract classification - track type

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Session Classification: Poster Session 1