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## Matching of the H<sup>-</sup> beam to the low and medium energy section of the CERN Linac4

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### Abstract

Linac4 is the near future 160 MeV H<sup>-</sup> linear accelerator of the CERN presently under construction. It will replace the present Linac2 as injector of the proton accelerator complex in CERN. The Linac4 is composed of a 45 keV ion source, a Low Energy Beam Transport (LEBT), a 352.2 MHz Radio Frequency Quadrupole (RFQ), which accelerates the beam to 3 MeV, and a Medium Energy Beam Transport (MEBT), housing a beam chopper, has been installed and commissioned in the Linac4 tunnel. The LEBT is composed of two solenoids and a diagnostic box; the MEBT is composed of three Radio Frequency (RF) cavities and 11 quadrupole magnets to match and transfer the beam from the source to the RFQ and DTL, respectively. In this paper, the beam matching process of the 45 keV H<sup>-</sup> beam to the RFQ and that of accelerated 3 MeV beam to the DTL has been presented. The MEBT beam commissioning was complemented with the emittance measurement of the DTL matched beam taken with a slit-and-grid emittance measurement device located after the MEBT line.

**Keywords:** Linac4, beam matching, LEBT, MEBT, solenoid, quadrupole magnets, RF cavity

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