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The C70XP injection line transverse distribution study and impact

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The C70XP is a cyclotron operated for production of radionuclides in nuclear medicine, for research in physics, radio-chemistry and biology. It aims at providing high intensity beams to the various experiment for long or very short time runs. The beam transverse distribution, e.g. homogeneity and emittance, has a great impact on the experiments. The ion source and subsequently the injection line, which can hold 4 types of particles (HH+, D-, He2+ and H-), being the first stage of the accelerator defining the beam, are therefore of particular focus for the beam studies.

Thus, a first study of the transverse beam distribution in the injection line has been measured with an Allison-type emittance-meter. Additionally, various simple shape collimators have been used and their impact has been measured in the extraction beam line. These studies have also been combined with multiple magnets tuning simulating various operating mode.

A model of the injection line based on G4Beamline has been performed. The experimental and simulation results are given in this paper as well as the on-going studies for a potential future collimator.

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Footnotes

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Primary author: DURAND, Teddy (Cyclotron ARRONAX)

Co-authors: HADDAD, Ferid (Laboratoire SUBATECH UMR 6457); POIRIER, Freddy (Cyclotron ARRONAX)

Presenter: DURAND, Teddy (Cyclotron ARRONAX)

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