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Injector and synchrotron commissioning of helium ion beams at the MedAustron Ion Therapy Center

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MedAustron is a synchrotron-based ion cancer therapy facility located in Austria. Patients are treated with proton and carbon ion beams in an energy range of 62-252 MeV and 120-402 MeV/u, respectively. The facility features three clinical irradiation rooms, among which horizontal and vertical beam lines as well as a proton gantry are available for treatment. A fourth irradiation room is dedicated to non-clinical research. In 2021, a development project started, which aims at commissioning helium ion ($^4He^{2+}$) beam up to the non-clinical irradiation room. A first major milestone was reached by completing the commissioning of helium in the ECR ion source branch, the LEBT and the LINAC section, where the beam is accelerated up to 7 MeV/u. In this work we discuss the challenges and main results achieved during the injector commissioning (i.e. emittance, intensity and transmission efficiency). Furthermore, recent outcomes from the injection of $^4He^{2+}$ beam into the synchrotron as well as acceleration and extraction results are presented.

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Footnotes

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