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Innovations in the Next Generation Medical Accelerators for Therapy with Ion Beams

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Modern hadron-therapy accelerators have to provide high intensity beams for innovative dose-delivery modalities such as FLASH, pencil beams for 3D scanning, as well as multiple ions with radio-biological complementarity. They need to be compact, cheap and have a reduced energy footprint. At the same time, they need to be reliable, safe and simple to operate. Cyclotrons and compact synchrotrons are nowadays the standard for proton therapy. For heavier ions such as carbon, synchrotrons remain the most viable option, while alternative solutions based on linacs, FFAs or cyclotrons are being proposed. In this context, the European project HITRIplus studies the feasibility of an innovative super-conducting magnets synchrotron for carbon ions, with state-of-the-art multi-turn injection from a specially designed linac and advanced extraction modalities. A compact synchrotron optimized for helium ions, making use of proven normal-conducting technology, is also being designed.

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Footnotes

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Yes

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