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Advancements of integration and mechanical design of gantries for ion-therapy

This presentation outlines the recent progresses on the mechanical design and integration of components of gantries for ion-therapy of cancer, which are crucial steps toward the development of the next ion medical machine. A comparative study of multiple scenarios was conducted based on robustness of the design, size, weight and complexity, deformation and precision performances and costs, as well as environmental impact. Four prospective scenarios were identified, each of them capable of providing beam to at least 220° around the patient. One scenario is capable of providing treatment angles of 360°. Results show that in statically balanced scenarios, considerable improvements can be reached in terms of safety, deformation, precision performances, complexity and costs of implementation. All scenarios are deemed suitable for further gantry design development. Further steps in the integration studies are outlined, such as the study of the effect of mechanical errors on the optic elements of the transfer line and general system integration.

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