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FLASH proton therapy facility design with permanent magnets

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We present a design of the proton FLASH radiation therapy facility using the Brag peak to be built at Stony Brook University Hospital at the Radiation Oncology Department. It includes an injector using a commercially available injector cyclotron (10-30 MeV), fixed field alternating (FFA) gradient beam lines, permanent magnet Fixed Field Alternating Gradient non-scaling variable transverse field fast-cycling synchrotron accelerator with unprecedented kinetic energy range between 10-250 MeV, and a permanent magnet delivery system the FFA gantry. This facility removes limitations of the present proton cancer therapy facilities allowing FLASH radiation to be performed with 40 Gy/s in 100 ms. This allows treatment with the FLASH therapy without magnet adjustments for any proton kinetic energy between 70-250 MeV. The proposal is based on already experimentally proven FFA concept at the Energy Recovery linac 'CBETA' built and commissioned at Cornell University.

Footnotes

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Primary author: TRBOJEVIC, Dejan (Brookhaven National Laboratory)

Co-author: BROOKS, Stephen (Brookhaven National Laboratory)

Presenter: TRBOJEVIC, Dejan (Brookhaven National Laboratory)

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