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Exploring of advances in high gradient technologies for use in hadron therapy accelerators

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Research in the field of hadron therapy has led to a new perspective for radiotherapy treatment of cancer patients through the development of a linear proton accelerator based on high gradient technology. The main challenges of such a facility are the effective acceleration of low energy beams and the reduction of the facility footprint and its electricity consumption. All-linac designs for proton and light ion therapy linacs have potential advantages over existing circular facilities. Recent developments at CERN high frequency RFQs and high-gradient accelerating structures can make important contributions to linac-based facilities. High performance of these components during high power test indicates their potential. The maximum gradient and high gradient limiting factors of linacs are described.

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