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Characteristics of focused very high energy electron (VHEE) beams in radiotherapy

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Very High Energy Electron (VHEE) beams represent a promising alternative for treating deep-seated tumors. However, VHEE beams generate quasi-uniform dose distribution along the beam path, leading to healthy tissue overexposed. Focused VHEE beams are a revolutionary radiotherapy technology that enables concentrating doses into a small and well-defined spot with an extremely high dose rate. This paper estimates the dose deposition and presents the influence of different focus depths. The contributions of secondary particles are further discussed. In addition, a focused beamline is designed using two triplets of quadrupole magnets to transport and focus VHEE beams onto the water phantom.

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