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Recent progress on laser-driven Very High Energy Electron radiotherapy

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Radiotherapy is one of the mainstream methods for cancer treatment. In recent years, the use of very high energy electron beams (VHEE, generally with energies between 50MeV and 300MeV) for deep tumor radiotherapy has been very active in international research. Due to its superior dose deposition characteristics compared to traditional X-rays and its pencil beam scanning capability comparable to ion beams, it is considered to be a very promising new type of radiotherapy method in the future. The use of ultra-high gradient laser wakefield acceleration (LWFA) can further reduce the size and cost of such electron radiotherapy devices, making them more attractive in the field of radiotherapy. This talk will introduce our team's recent progress in the LWFA-based VHEE radiotherapy studies, including the development of high-reliability industrial-grade ultrashort ultra-intense laser systems as well as high-stability laser wakefield accelerators, experimental studies on irradiation of tumors in small animals, and the new design of a LWFA-based VHEE prototype for radiotherapy.

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