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Linear Accelerators I

Wednesday 25 September 2024 09:35 (1 hour)

Linear Accelerators (Linacs) are a systems that allow to accelerate charged particles through a linear trajectory by electromagnetic fields. This kind of accelerators find several applications in fundamental research and industry. The main devices used to accelerate the particle beam are described in the first part of the lecture with their main parameters. This includes both Standing (SW) and Traveling Wave (TW) radiofrequency cavities, for different type of accelerated particles (protons, ions and electrons) such as Drift Tube Linacs (DTL), multi cell cavities, Side Coupled Cell (SCC) and disk loaded structures. In the second part of the lecture, the fundamental principles of the longitudinal and transverse beam dynamics of accelerated particles will be highlighted. Finally, we briefly illustrate the radiofrequency quadrupole (RFQ) devices.

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