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Linac beam dynamics

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Several linacs will bring the beam energy up to the nominal initial booster energy of 20 GeV. This will be achieved in several sections. The electron linac, from the exit of the gun section at 200 MeV up to 1.54 GeV will increase the bunch energy to 6 GeV, the common linac, where both electrons and positrons will travel, from 1.54 GeV up to 6 GeV, and the high energy linac to the final 20 GeV. We considered several options to reach the target parameters requested by the booster in terms of energy spread, bunch length, and emittance growth as well. In this presentation we will show the different configurations that we investigated including some considerations on the energy compressor, realistically installed in the transverse line from the linac exit to the booster. We will finally show the configuration to be used as a baseline for the pre-injector, which allow satisfying all the booster requests with some margin and the possibility of independently tune the final parameters.

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