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Low EMittance Muon Accelerator

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A study of a new scheme to produce very low emittance muon beams using a positron beam of about 45 GeV interacting on electrons on target is presented. One of the innovative topics to be investigated is the behaviour of the positron beam stored in a low emittance ring with a thin target, that is directly inserted in the ring chamber to produce muons. Muons can be immediately collected at the exit of the target and transported to two μ+ and μ− accumulator rings and then accelerated and injected in muon collider rings. We focus in this paper on the simulation of the e+ beam interacting with the target, the effect of the target on the 6-D phase space and the optimization of the e+ ring design to maximize the energy acceptance. We will investigate the performances of this scheme, ring plus target system, comparing different multi-turn simulations. A preliminary review of the full scheme parameters is discussed in view of the results obtained on the ring plus target system.

Primary author: ANTONELLI, Mario (LNF)

Presenter: ANTONELLI, Mario (LNF)

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