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## Studies of a scheme for low emittance muon beam production from positrons on target

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A new scheme to produce muon beams characterized by very low emittance, in such a way to avoid the need for cooling, using a positron beam of about 45 GeV interacting on electrons on target is being studied by our group. This scheme is challenging and innovative, and needs a full design study to be developed. In particular, one of the novel topics to be investigated is the interaction between the positron beam stored in a low emittance ring with a thin target, to be inserted directly in the ring chamber to produce muons. Produced muons will then be immediately collected at the exit of the target and transported to two  $\mu^+$  and  $\mu^-$  accumulator rings. In this work, we discuss the simulation of the  $e^+$  beam interacting with the target, its degradation in the 6-D phase space and the optimization of the  $e^+$  ring design mainly to maximize the energy acceptance. To this aim, two different approaches has been followed using different codes, in order to compare their results regarding the performances of this scheme.

### Experimental Collaboration

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