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An approach to pin down the top quark mass parameter in MC event generators

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To control the scheme of the Monte-Carlo (MC) top quark mass parameter several ingredients are mandatory, concerning the knowledge of the IR dynamics of the top mass sensitive observable, the MC parton shower and the MC hadronization evolution. I discuss these ingredients and their interplay for the simple case of 2-jettiness for boosted top production in electron-positron annihilation, where these ingredients are now all known for the HERWIG MC. Apart from having an at least NLL precise parton shower, which Herwig can provide for event-shapes, a crucial novel development is a QCD factorization compatible hadronization model, which I describe in some detail. The outcome is that for 2-jettiness the HERWIG top mass mass parameter represents a well defined and shower cut dependent renormalization scheme that can be defined NLO. The approach I discuss represents a blueprint for controlling the scheme of the MC top mass parameter that may eventually be also applied to direct-type top quark mass measurements.

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