

Early Career Researchers & Muon Colliders



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Electroweak radiation picture of the future multi-TeV muon collider

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As a potential energy frontier machine, a multi-TeV muon collider presents a vast array of physics opportunities, ranging from Higgs and top quark production to W/Z factories, jet studies, and neutrino sources. At energies far exceeding the electroweak scale, radiation effects become crucial and demand careful consideration. I will introduce the electroweak parton framework for high-energy lepton colliders, emphasizing the role of electroweak parton distribution functions (EW PDFs) in governing initial-state radiation (ISR). Utilizing this framework, I will outline the Standard Model (SM) predictions for prospective high-energy electron-positron and muon colliders, offering key insights for future analyses. Additionally, I will explore the rich physics landscape that a future muon collider could unlock, providing a comprehensive overview of the potential scientific advancements at high-energy lepton colliders.

Author: Dr MA, Yang (INFN Bologna)

Co-authors: XIE, Keping (Michigan State University); HAN, Tao

Presenter: Dr MA, Yang (INFN Bologna)

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