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Detector Backgrounds at Muon Colliders

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Physics goals of a Muon Collider (MC) can only be reached with appropriate design of the ring, interaction region (IR), high-field superconducting magnets, machine-detector interface (MDI) and detector. All - under demanding requirements, arising from the short muon lifetime, relatively large values of the transverse emittance and momentum spread, unprecedented dynamic heat loads (0.5-1 kW/m) and background particle rates in collider detector. Results of the most recent realistic simulation studies are presented for a 1.5-TeV MC. It is shown that an appropriately designed IR and MDI with sophisticated shielding in the detector has a potential to substantially suppress the background rates in the MC detector. The background levels for sub-detectors are compared to those expected at the LHC and CLIC at the nominal luminosity.

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