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Instrumented Shielding for Muon Collider Detectors

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The challenges for detectors at a Muon Collider come from decay products of muons within the collider ring. Earlier designs have featured massive shielding cones in the forward regions to reduce these backgrounds into a detector, creating detector dead zone and limiting the physics potential. Updated muon collider designs that entail lower IP emittances can deliver the same luminosity with fewer muons/bunch. Recent innovations in detector technology can allow for the detector to extend further into the forward region. Here we consider an additional route to improve muon collider performance by instrumentation within the predominantly tungsten forward shielding to extract additional physics information.

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