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Sweeper Magnet study

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At the FPF site, the background muon levels are expected to be similar to those at the current FASERν site. While the FASERν experiment requires replacing the detector 2-3 times per year, we aim to reduce this to once per year for FASERν2. To achieve this, We studied possibilities to use a sweeper magnet to reduce the background muons to one-third.
In this study, I performed GEANT4 simulations using background muons generated by BDSIM to evaluate the magnet's effects. The results demonstrate that the magnet can be effective depending on its placement. Furthermore, placing the magnet 370 meters from the ATLAS interaction point in the LHC tunnel and relocating the FPF to a position 700 meters away from the ATLAS IP was shown to reduce the background muons by up to 40%.

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