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A proposal of a momentum collimator in RHIC warm section for controlling experimental background at sPHENIX

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One of the issues that the AuAu 100 GeV physics program in 2024 in RHIC encountered was background in the sPHENIX MVTX detector, which causes autorecoveries and preventing continuous data taking. Beam studies and track simulations performed to understand the source of the background and potential measures to control it have led to the conclusion that off-momentum particle loss was an issue. This article will focus on a proposal of a momentum collimator in warm sections in RHIC to control the MVTX background. We will elaborate the selection of the locations for the collimator, the strategy of generating substantial horizontal dispersion there, the required additional powering scheme for selected quads and the optimization of the figure-of-merit for momentum collimation.

Footnotes

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