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Muon momentum distribution from radial beam measurements in the Muon g-2 Storage Ring at Fermilab

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A method to reconstruct the momentum distribution of the injected muon beam in the Muon g-2 Storage Ring at Fermilab has been developed, which is based on beam profile measurements from the Muon g-2 straw tracking detectors as input. Extending a spectrometric perspective to the muons injected into the Muon g-2 storage ring, a direct transformation of the beam radial coordinates when the distribution recreates the initial beam conditions and when the muons are separated proportionally to their magnetic rigidities provides a precise method to measure the energy distribution of the stored beam. The obtained energy distribution can be used to quantify the dominant beam-dynamics corrections to the final measurement of the muon g-2 experiment.

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Footnotes

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Yes

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