

In-Situ Calibration of the sPHENIX Hadronic Calorimeter using Isolated Single Hadrons

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April 2023

1 A first goal from early running of the sPHENIX detector, which has begun
2 data-taking this year, is to ensure an accurate calibration of its calorimeters
3 and a complete understanding of the uncertainties associated with these cali-
4 brations. Both of these steps are necessary for successfully achieving the physics
5 goals of sPHENIX, especially in conducting various high-precision jet measure-
6 ments with sPHENIX having the first hadronic calorimeter at mid rapidity at
7 RHIC. This study explores measurements of the calorimetric response to single
8 hadrons in the sPHENIX calorimeter system, which is comprised of an electro-
9 magnetic calorimeter, followed by an inner and outer hadronic calorimeter made
10 of aluminum and steel absorber, respectively. In this study, the momentum p of
11 isolated tracks, those separated by a minimum distance from the nearest other
12 tracks, are found utilizing the sPHENIX charged-particle tracking systems and
13 are matched to calorimeter energy deposits with energy E ; E/p distributions
14 are then constructed for use in precise data-to-MC comparisons. The method-
15 ology regarding the minimization of background energy from neutral particles
16 within the track isolation area will also be presented. These measurements can
17 be used to understand the hadronic response and quantify the uncertainty in
18 the calorimeter hadronic response between data and MC.