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High p_T PID using Time-of-Flight with Multi-gap Resistive Plate
RONALD BELMONT, Vanderbilt University, PHENIX COLLABORATION — In Run7 of RHIC the PHENIX experiment operated a Time-of-Flight detector based on Multi-Gap Resistive Plate Chambers. The detector covers an area of 8 m^2 in the PHENIX West arm spectrometer and together with the previously installed Aerogel Cherenkov Counters (ACC) completes the high-p_T particle identification (PID) upgrade in PHENIX. Intrinsic detector timing resolution of σ_t 80 ps has been achieved, which allows for 4 σ π/K separation up to p_T 3 GeV/c and K/p separation up to p_T 5 GeV/c. Combined with ACC, the new detector system provides seamless PID for $\pi/K/p$ in the range $0.2 < p_T < 9$ GeV/c. The PID for resonances has been extended to even higher (> 10 GeV/c) p_T. The track-by-track identification with increased angular coverage allows for jet correlation measurements with PID in both the near side and away side jet cones. Jets have been shown to be significantly modified in heavy ion collisions at RHIC when compared to the p+p reference data. Identified particle measurements at high p_T are a key to understanding the underlying jet suppression mechanisms. The MRPC-TOF performance and the extended physics capabilities of PHENIX will be discussed.

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