The PHENIX Hadron Blind Detector

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As our understanding of the new states of matter created in RHIC collisions increases, so too does the need for a look "inside" the medium through the use of color-neutral or so-called penetrating probes. Among these are electrons, photons, and muons. Electron measurements in the PHENIX central arm are hampered by the large combinatorial background resulting from random combinations of positrons and electrons that were not created as a pair. These random combinations are dominated by the principal sources of electrons; π^0 Dalitz decays and photon conversions. Each of these sources leaves the unique signature of a small opening angle and can be identified by a detector placed immediately following the beam pipe.
The PHENIX hadron blind detector (HBD) was built expressly for this purpose and was used for the first time in Run 7. Each half of the detector consists of twelve triple-GEM stacks whose top most GEM is coated with CsI, making the device photo-sensitive in the deep ultraviolet. Cherenkov light from relativistic electrons forms unfocused blob patterns in the cathode. Electron pairs are identified both by pulse height (in the case of complete overlap) and by blob size/shape. Results from the HBD in Run 7 and its overall performance will be discussed.

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