

Development of Aerogel Cherenkov Counter for PHENIX Experiment.

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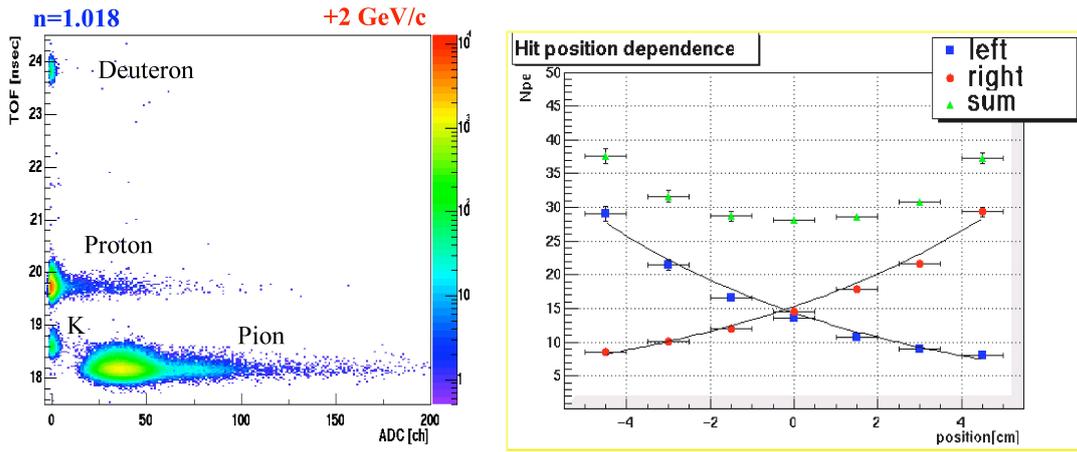
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Experiments at Relativistic Heavy Ion Collider (RHIC) of Brookhaven National Laboratory have been started in 2001. From the analysis of data taken in 2001, suppression of hadrons with large transverse momentum has been observed and considered as very important outcome for Quark-Gluon physics. Also the importance of particle identification at large transverse momentum region has been brought to people's attention.

To enhance the particle identification capability of PHENIX Experiment, installation of Aerogel Cherenkov Counters are under investigation as a future upgrade of the experiment. PHENIX experiment is currently equipped with high resolution time-of-flight counters (TOF, timing resolution of <100 ps) and Ring Image Cherenkov counters (RICH, index of reflection, $n = 1.004$). Having the Aerogel Cherenkov counter with $n=1.01$ together with TOF and RICH, we can identify $\pi/K/p$ upto 10 GeV/c without any gap in momentum.

We have built two prototypes for the test experiment (T496) at KEK-PS; Belle type (Aerogel w. 2 PMT's on the side) and Mirror type (mirror followed by 1 PMT behind the Aerogel) with various reflectors. So far, best result (>20 p.e.) was obtained from Belle type with 3" PMT's and Goretex as reflector. Position dependences of both counters are found to be acceptable.

To obtain final design of the Aerogel, further beam test is scheduled.



Figure; Left) Particle identification with Aerogel and TOF. Right) Position dependence observed with Belle type.