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Aerogel based Cherenkov counters for momenta above 20 GeV/c

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Silica based aerogel is unique transparent material with tuneable refractive indexes between gaseous and liquid substances. Since 1986 a huge experience in aerogel production for HEP experiments was accumulated in Novosibirsk by Budker Institute of Nuclear Physics in cooperation with Boreskov Institute of Catalysis. Refractive indexes of aerogels produced in Novosibirsk are in range from 1.008 to 1.13. Rayleigh light scattering length at wavelength 400nm for synthesised aerogels usually is above 40mm. Recent progress and current status of aerogel based Cherenkov detectors development in Novosibirsk are presented. Several concepts of RICH detectors based on aerogels with refractive index around n=1.008 are considered. Results of GEANT4 simulation are presented. Requirements to position-sensitive photon detectors are formulated, some technical solutions and availabilities are discussed. Conceptual design of RICH detector prototype based on aerogels with n=1.008 and beam tests plan are given as well.

Primary author: BARNYAKOV, Alexander (Budker Institute of Nuclear Physics)

Presenter: BARNYAKOV, Alexander (Budker Institute of Nuclear Physics)

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