electron and positron beam are scattered off an unpolarized hydrogen gas target. The beam-charge asymmetry A_C is evaluated as

$$A_C(\varphi) = \frac{(N^+(\varphi) - N^-(\varphi))}{(N^+(\phi) + N^-(\varphi))}$$

where $N^+(\varphi)$ and $N^-(\varphi)$ represent the single-photon yields per φ bin, normalized to the number of detected inclusive events using the positron and electron beam, respectively.

The observed asymmetry, shown in Fig. 1, is attributed to the interference between the DVCS and BH processes.

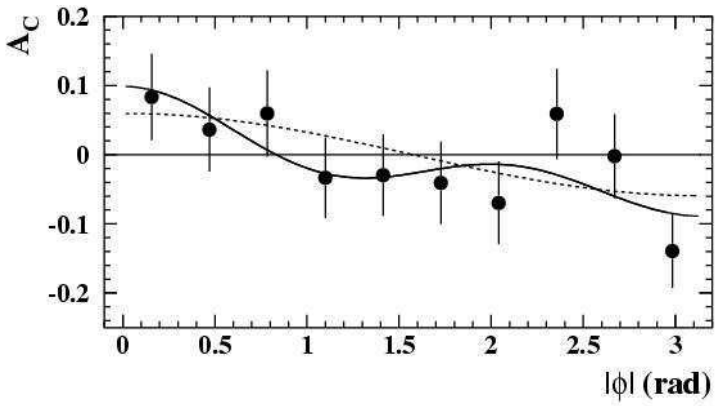

Fig. 1 Beam-charge asymmetry A_C for the hard electroproduction of photons off protons as a function of the azimuthal angle $|\varphi|$. Statistical uncertainties are shown. The solid curve represents the four parameter fit: $(-0.011\pm0.019) + (0.060\pm0.027)\cos\varphi + (0.016\pm0.026)\cos 2\varphi + (0.034\pm0.027)\cos 3\varphi$. The dashed line shows the pure cos φ dependence.

1.7 Monte-Carlo Simulations of Two-gluon Fields, Confinement and the QCD Gluon Propagator

by H.P.Morsch[1)], P.Żuprański

The decay of a colour neutral 2-gluon system in qq^- and $2q2q^-$ has been simulated with the Monte-Carlo method, taking into account a 1-gluon exchange interaction between the emitted quarks folded with a 2-gluon density determined self-consistently. Finite 2-gluon densities are formed with a mean square radius $< r^2 >$ of about 0.4-0.5 fm^2. By solving the relativistic Schrödinger equation, the binding potential of the 2-gluon system is computed. This is consistent with the confinement potential from lattice QCD. The deduced momentum distributions give a good account of the tensor and scalar part of the gluon propagator determined from a lattice gauge calculations, indicating that this important quantity of QCD is directly related to the 2-gluon densities discussed.

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1.8 Improvements in Particle Identification Algorithms for the S254 Software

by A.Mykulyak and B.Zwięgliński for the ALADIN 2000 Collaboration at GSI-Darmstadt

The growing interest in isospin effects in nuclear reactions is motivated by an increasing awarness of the importance of the symmetry term in the nuclear equation of state, in particular for astrophysical applications. Supernova simulations or neutron star models require inputs for the nuclear equation of state at extreme values of density and neutron-proton asymmetry (see e.g. [1]). Four different beams ^{107}Sn, ^{124}Sn, ^{124}La, and ^{197}Au, all with incident energy of 600 A MeV have been used in the S254 experiment to shed more light on this issue.

The experimental setup incorporated the ALADiN spectrometer with an upgraded detection system (see Fig. 1), the fragment separator (FRS) to produce the unstable beams ^{107}Sn and ^{124}La and the large neutron detector LAND. The detection system consists of a series of ionization chambers (ICs) and proportional counters (PCs) mounted vertically on both sides of the cathode. Each PC is divided into three sections. The intrinsic gain mechanism involved in PCs permitted to lower the detection threshold of the combined system down to Z = 2.