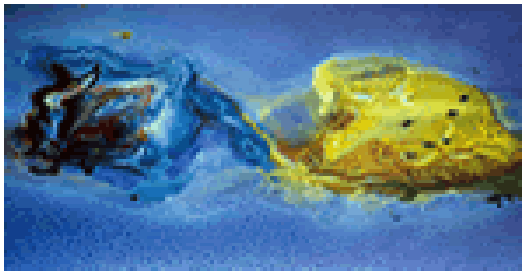

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# A look at hadronization via high multiplicity

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Multiparticle production is studied experimentally and theoretically in QCD that describes interactions in the language of quarks and gluons. In the experiment the real hadrons are registered. For transfer from quarks and gluons to observed hadrons various phenomenological models are used.
In order to describe the high multiplicity region, we have developed a gluon dominance model (GDM). It represents a convolution of two stages. First stage is described as a part of QCD. For second one (hadronisation), the phenomenological model is used. To describe hadronisation, a scheme has been proposed, consistent with experimental data in the region of its dominance. Comparison of this model with data on e+e- annihilation over a wide energy interval (up to 200 GeV) confirms the fragmentation mechanism of hadronisation, the development of the quark-gluon cascade with energy increase and domination of bremsstrahlung gluons.
The description of topological cross sections in pp collisions within of GDM testifies that in hadron collisions the mechanism of hadronisation is being replaced by the recombination one. At that point, gluons play an active role in the multiparticle production process, and valence quarks are passive. They stay in the leading particles, and only the gluon splitting is responsible for the region of high multiplicity.
GDM with inclusion of intermediate quark charged topologies describes topological cross sections in a proton-antiptoton annihilation and explains linear growth of a secondary correlative momentum in the negative area.
The scaled variance of a neutral pion number mesuared by us is rising abruptly in the region of high total multiplicity and differs from Monte Carlo predictions by seven standard deviations. The growth of fluctuations of the neutral pion number in this region may indicate the formation of a pion (Bose-Einstein) condensate. While searching for this collective phenomenon, events with a predominance of a large number of neutrals (16) among total multiplicity (32) have been found along with an indication that “centaurs” exist. Despite the growth of fluctuations on the neutral number, their average remains equal to 1/3 of the total pion number.
Our planned study of soft photon yield in the region of high multiplicity at U-70 and Nuclotron is presented.

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