



Contribution ID: 17

Type: not specified

Study of soft photon yield in pp and pA interactions at JINR

Wednesday, 5 June 2019 17:00 (20 minutes)

Over 30 years there has been no comprehensive understanding of the mechanism of soft photons formation (energy smaller 50 MeV). Experimental data indicate an excess of their yield in hadron and nuclear interactions in comparison with calculations performed in QED. For a more thorough study of this phenomenon at the Nuclotron (JINR's superconducting accelerator), preliminary measurements have been carried out with using an electromagnetic calorimeter based on BGO crystals.

These results are consistent with the world ones. In JINR, in connection with the building of a new accelerator complex NICA, it has become possible to carry out such studies in pp, pA and AA interactions at energies up to 25 A GeV. Our group develops the conception of an electromagnetic calorimeter on type “spaghetti” based on gadolinium gallium garnet (GaGG) crystals, which have significantly lower the threshold for registration of photons. The first tests of electromagnetic calorimeters manufactured at JINR on the basis of the GaGG and a mixture of tungstate and copper are reported.

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Session Classification: Session 4