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Geant4 mathematical model of gas-filled straw detector

The paper describes a method for modeling equipment for measuring and identifying particles such as protons, muons, electrons, pi-mesons and kaons. A new method of particle detection using straw tubes made of 36 microns of mylar coated with 20nm gold filled with a mixture of Ar and CO_2 gases in a ratio of 70% to 30% has been studied. The main design elements of the straw detector are a gas in which the particle leaves energy, ionizing the surrounding particles; the number of straw tubes in this experiment is 150 layers (3+2), which will allow calculating energy release in various ranges and reconstructing the dE/dX pattern for further identification of particles. The concept of equipment based on Geant4 software has been developed for simultaneous control of detectors and obtaining common characteristics. This work was carried out as part of collaboration activities in the SPD NICA projects at the Joint Institute for Nuclear Research and NA62 at CERN. The test measurements describe the proposed models well.

Section

Nuclear physics (Section 1)

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