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Alternative gas mixtures for the straw detector of the TRT ATLAS experiment

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Gas mixtures based on xenon, argon, krypton, oxygen with the additive were studied. Values of the gas gain, the breakdown voltage for the straight and curved straw was studied. It was shown that in order to provide a necessary stability an addition of equal 3% oxygen is required. Safe operation range for all mixtures is up to gas gain equal 5*10ˆ4. Tests with a real Barrel module confirmed these results and shown that without oxygen detector cannot sustain irradiation even at the gas gain less than 2,5*10ˆ4 and Barrel works with argon mix if oxygen content more than 1%. Barrel works with xenon mix without oxygen. Safety margin for argon mix near 180 V, for the krypton mix near 160 V, xenon mix varies from O2 = 0% from 100 V to 170 V for 3% of oxygen for gas gain equal 2,5*10ˆ4.

Presentation type

Section talk (10+5 min)

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