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Di-electron reconstruction in Au+Au@1.23 GeV/u

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Systematic studies of di-electron and strangeness production in the few GeV per nucleon energy regime have been performed in the past years with the High Acceptance Di-Electron Spectrometer, installed at GSI Helmholtzzentrum für Schwerionenforschung in Darmstadt.

In the most recent measurement, di-electron production for the heaviest collision system, Au+Au at the top SIS18 beam kinetic energy of 1.23 GeV/u have been investigated. For the first time in such a collision, where long lifetimes of the fireball are expected, the di-lepton signal has been obtained.

Pure electron identification has been achieved by exploring information from the Ring Imaging Cherenkov detector together with a time-of-flight measurement and with an electromagnetic cascade signature in the Pre-Shower detector. Decision is taken upon the response of a neural network trained with high purity tracks. Topological cuts are used to suppress combinatorial background.

In this contribution we will present details of signal extraction and the investigations of its purity based on detailed Monte Carlo studies. Furthermore, in order to extract signal from non-trivial pairs a combinatorial background has to be suppressed.

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