

# **A MULTIVARIATE STUDY OF MASS COMPOSITION FOR SIMULATED SHOWERS AT THE AUGER SOUTH OBSERVATORY.**

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The output parameters from the ground array of the Auger South observatory, were simulated for the typical instrumental and environmental conditions at its Malargue site using the code sample-sim. Extensive air showers started by gammas, protons and iron nuclei at the top of the atmosphere were used as triggers. The study utilized the air shower simulation code Aires with both QGSJet and Sibyll hadronic interaction models. A total of 1850 showers were used to produce more than 35,000 different ground events. We report here on the results of a multivariate analysis and neural network approach to the development of new primary composition diagnostics.