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Search for Magnetic Monopoles and High Electric Charge Objects in the ATLAS Detector

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The concept of a magnetic charge, analogous to electric charge, has been around for many centuries. Paul Dirac formally introduced the concept into electromagnetism and quantum mechanics concluding that, If observed, Magnetic Monopoles would potentially explain the quantization of the electric charge and complete the symmetry between electricity and magnetism in Maxwells'equations. Since then there have been many searches for Magnetic Monopoles through different experimental techniques, none of which have given conclusive results on the matter. We present a search for Dirac Magnetic Monopoles and High Electric Charge Objects in the ATLAS detector from 13TeV pp collisions at the LHC. Detection is based on the particles'characteristic high ionization, penetration distance and lack of shower. A data driven method called the ABCD method is used to estimate the background in the signal region. Model independent efficiency maps are implemented to reduce the need for computationally intensive simulations.

Author: RODRIGUEZ VERA, Ana Maria (York University (CA))

Presenter: RODRIGUEZ VERA, Ana Maria (York University (CA))

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