

Investigating Dark Matter in Antiproton Cosmic Rays and Searching for Antimatter in Cosmic Rays with DAMPE

Using antimatter cosmic rays to search for dark matter is an important approach in dark matter research. However, there is still debate over whether dark matter is needed to explain the antiproton energy spectrum observed by AMS-02. The main research challenges lie in the difficulty of determining the solar modulation of antiprotons and the uncertainties in proton-proton collision cross-sections. We have studied whether the antiproton energy spectrum requires dark matter explanation based on various charge-dependent solar modulation models and updated proton-proton collision cross-sections. Additionally, I will report on the current progress of using DAMPE to search for antimatter. DAMPE is China's first space science satellite, which has been in orbit for eight and a half years, accumulating over 150 billion high-energy cosmic ray events, providing a possible opportunity for antimatter searches.

Primary author: XU, Zhi-Hui (Chinese Academy of Sciences)

Presenter: XU, Zhi-Hui (Chinese Academy of Sciences)

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