



Clues from the Sun on antimatter excess in cosmic rays

C. Grimani (1,2)

1. Institute of Physics, University of Urbino, Urbino, Italy, (2) INFN Florence, Italy
(cgrimani@fis.uniurb.it / Fax: +390722375933 / Phone: +390722375912)

Early time observations of antiprotons and positrons in cosmic rays seemed to show a major excess of antimatter with respect to the estimated secondary component of interstellar origin. This result has not been confirmed in the last ten years with the use of improved particle detectors and better data analysis techniques. We show that if the role of the Sun in modulating opposite charge particle fluxes is taken into account, no positron or antiproton production in exotic processes or antimatter of extragalactic origin need to be claimed in order to explain recent measurements in the whole energy range. In particular, positron observations are found consistent with a secondary origin with a minor contribution of e+ produced at the pulsar polar cap. The PAMELA experiment will take positron and antiproton data by the beginning of 2006 during negative solar polarity epoch with unprecedented accuracy and it will allow us to confirm or disprove these speculations. For an additional check, the PHOBUS experiment on the Laser Interferometer Space Antenna (LISA) will monitor short and long term proton and helium nucleus flux fluctuations during the expected mission lifetime of 10 years starting by 2014.