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Unique Properties of Daily Helium Fluxes up to 100 GV

Thursday 18 July 2024 20:40 (20 minutes)

The precision measurement of daily helium fluxes with AMS during twelve years of operation in the rigidity interval from 1.71 to 100 GV is presented. The helium flux and the helium to proton flux ratio exhibit variations on multiple timescales. In nearly all the time intervals from 2014 to 2018, we observed recurrent helium flux variations with a period of 27 days. Shorter periods of 9 days and 13.5 days are observed in 2016. The strength of all three periodicities changes with time and rigidity. In the entire time period we found that below ˜ 7 GV the helium flux exhibits larger time variations than the proton flux, and above ˜ 7 GV the helium to proton flux ratio is time-independent. Remarkably, below 2.4 GV a hysteresis between the helium to proton flux ratio and the helium flux was observed at greater than the 6σ level. This shows that at low rigidity the modulation of the helium to proton flux ratio is different before and after the solar maximum in 2014.

Alternate track

I read the instructions above

Yes

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