AMS

A cosmic ray observatory on space

F. Barao, Jornadas LIP 2018 (Évora)

Alpha Magnetic Spectromete

Installed on the International Space Station (ISS) in May of 2011

Collected more than 112,500,000,000 events up to this day, at a rate of about 45 million events per day

Most of primary cosmic rays crossing AMS are protons

AMS detector

Upper TOF



Lower TOF

Ring-Imaging Cherenkov Detector



Transition Radiation Detector





Sillicon Tracker



Electromagnetic Calorimeter



90 min orbit at 400 Km **Geomagnetic field weaker at poles**



Rigidity (GV)



AMS results

electron/positron vs proton/antiproton separation





Z=1 fluxes





Positrons and antiprotons

AMS p/p results and modeling



Z>=1 fluxes



Not a single power law spectrum

$$\Phi = C \left(\frac{R}{45 \text{ GV}}\right)^{\gamma} \left[1 + \left(\frac{R}{R_0}\right)^{\Delta \gamma/s}\right]^s$$



proton fluxes



Proton fluxes measured at different times and by different experiments

Time variability of fluxes is evident!

Solar modulation phenomena! (M Orcinha talk)

p/He fluxes



2.3

2.4

-2.5

4MS-02 He

AMS-02 proton



Primary (He, C, O) and secondary nuclei (Li, Be, B)



Data interpretation and other measurements

