

Professor Roberto Battiston

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Ground based: Argo, Magic,.....

A statistical procedure for the identification of positrons in the PAMELA experiment

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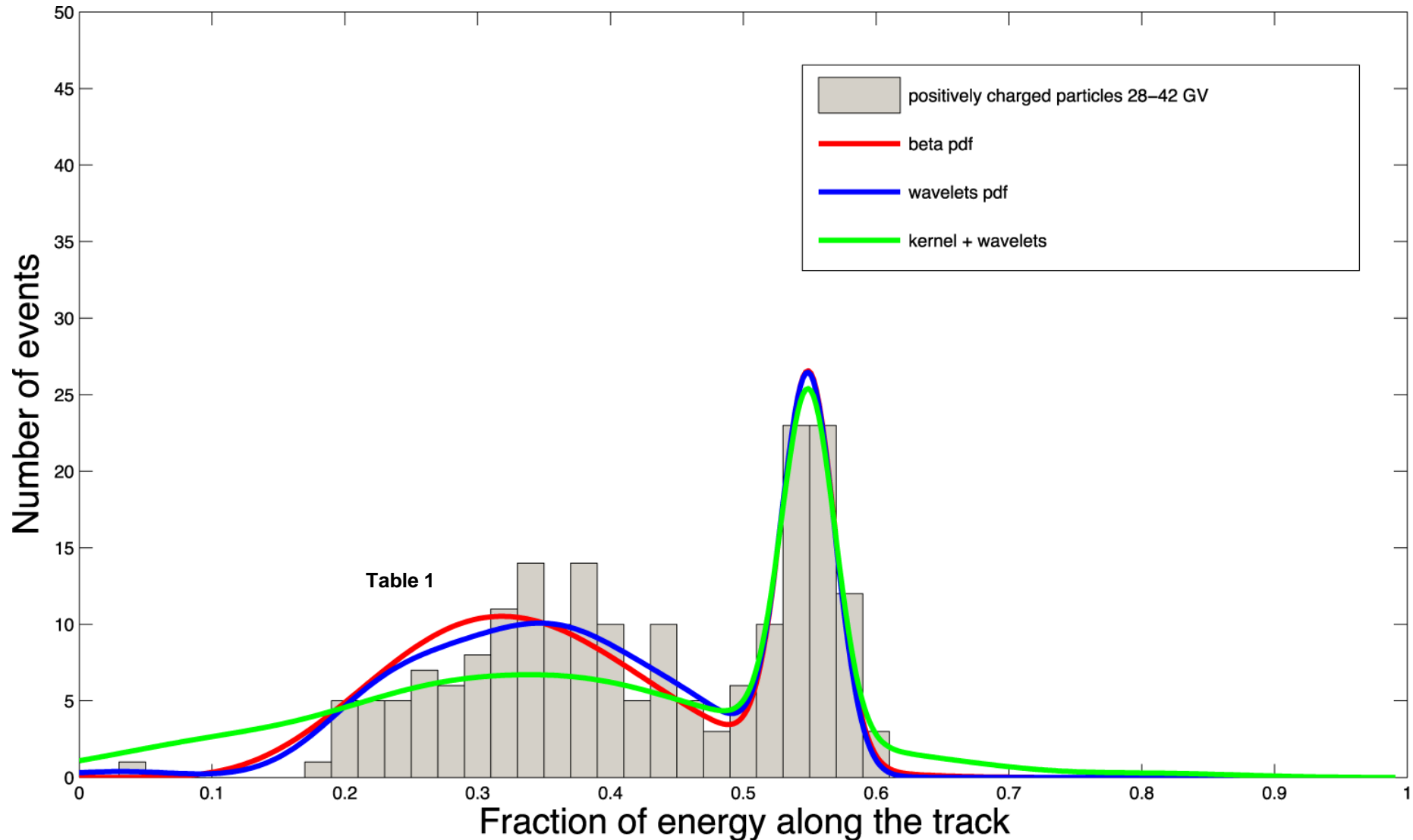


Figure 8: The distribution of positively charged particles for the rigidity bin 28-42 GV showing 3 pdf fits.

Rigidity at spectrometer (GV)	Percent error (beta)	Percent error (wavelets)	Percent error (kernelwith wavelets)
1.5-1.8	3.2%	2.6%	2.6%
1.8-2.2	2.6%	2.9%	2.6%
2.2-2.7	2.7%	2.6%	2.6%
2.7-3.3	2.9%	3.1%	3.1%
3.3-4.1	3.1%	3.9%	3.9%
4.1-5.0	3.6%	3.8%	4.3%
5.0-6.1	3.9%	5.7%	5.3%
6.1-7.4	4.7%	4.8%	4.4%
7.4-9.1	4.9%	4.9%	5.0%
9.1-11.2	4.7%	5.7%	5.9%
11.2-15.0	5.3%	5.0%	5.6%
15.0-20.0	6.1%	5.4%	6.3%
20.0-28.0	8.1%	7.5%	8.2%
28.0-42.0	10.1%	9.5%	11.2%
42.0-65.0	13.4%	12.4%	13.0%
65.0-100.0	25%	29.5%	25.3%

Table 1: Statistical errors on the positron fraction R for all rigidity bins.



New Measurement of the Antiproton-to-Proton Flux Ratio up to 100 GeV in the Cosmic Radiation

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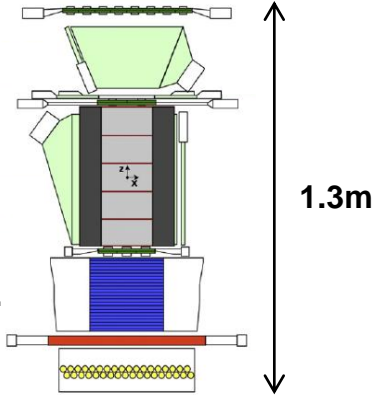
(PAMELA Collaboration)

TABLE I. Summary of proton and antiproton results.

Rigidity at spectrometer GV	Mean Kinetic Energy GeV	Observed number of events \bar{p}	p	Extrapolated $\frac{\bar{p}}{p}$ at top of payload
2.23–2.58	1.64	39	119 803 9	$(3.92 \pm 0.63) \times 10^5$
2.58–2.99	1.99	48	114 401 4	$(4.92 \pm 0.71) \times 10^5$
2.99–3.45	2.41	55	107 177 8	$(5.91 \pm 0.80) \times 10^5$
3.45–3.99	2.89	60	988 666	$(6.89 \pm 0.89) \times 10^5$
3.99–4.62	3.46	74	903 708	$(9.2 \pm 1.1) \times 10^5$
4.62–5.36	4.13	71	827 521	$(9.6 \pm 1.1) \times 10^5$
5.36–6.23	4.91	93	738 028	$(1.40 \pm 0.14) \times 10^4$
6.23–7.27	5.85	78	653 736	$(1.31 \pm 0.15) \times 10^4$
7.27–8.53	6.98	69	573 172	$(1.32 \pm 0.16) \times 10^4$
8.53–10.1	8.37	67	505 503	$(1.44 \pm 0.18) \times 10^4$
10.1–12.0	10.1	94	449 261	$(2.27 \pm 0.23) \times 10^4$
12.0–14.6	12.3	58	405 583	$(1.54 \pm 0.20) \times 10^4$
14.6–18.1	15.3	58	301 314	$(2.05 \pm 0.27) \times 10^4$
18.1–23.3	19.5	46	270 068	$(1.80 \pm 0.27) \times 10^4$
23.3–31.7	25.9	39	211 249	$(1.94 \pm 0.31) \times 10^4$
31.7–48.5	37.3	24	136 858	$(1.82 \pm 0.37) \times 10^4$
48.5–100.0	61.2	6	57 613	$(1.07^{+0.58}_{-0.39}) \times 10^4$

AMS-02

PAMELA



ECAL

Acceptance

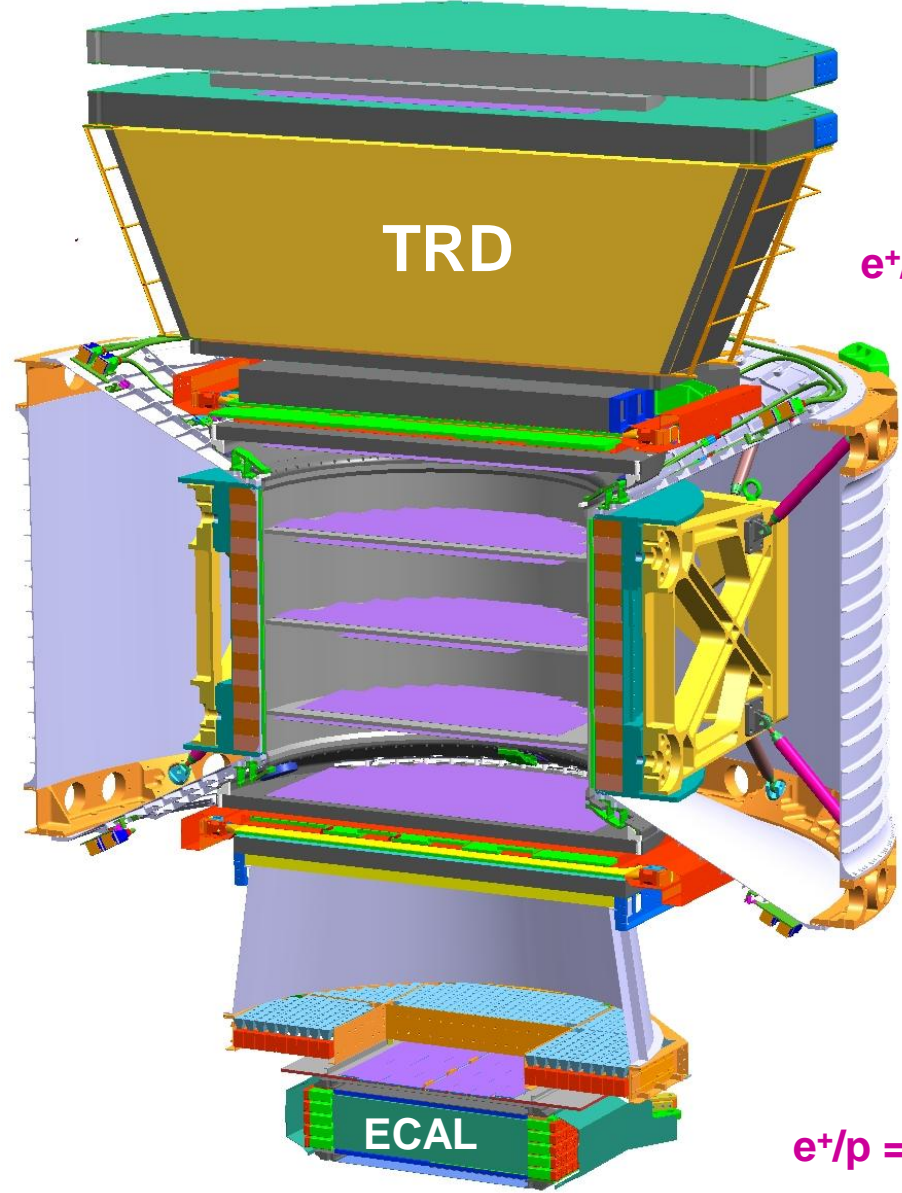
21.5 cm²sr

Astroparticle Physics
27 (2007) 296–315

Exposure (5yrs)

2006-2011

Published e⁺ data up to ~ 100 GeV



TRD

e⁺/p = 10⁻²

Magnet

ECAL

e⁺/p = 10⁻⁴

Acceptance

e⁺ 950 cm²sr

\bar{p} , He, \bar{He} , ... 4,500 cm²sr

Measured rejection at 0.4 TeV

e⁺/p = 10⁻⁶

Exposure (10 to 18 yrs)

e⁺ energy > 1 TeV