

Guangzhou Muon Multi-Directional Telescope

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Basic informations(*see*):

Geographic latitude	23.60⁰ N
Geographic longitude	113.18⁰ E
Altitude	20 m above sea level
Standard pressure, mbar [hPa]	1013
Vertical geomagnetic cutoff rigidity	16.0 GV
Detector type	6×4×2 plastic scintillate detectors (unit 0.5×0.5×0.05 m³)
X×Y×H, m	3.0×1.0×0.89
include lead	5cm
Площадь детектора, m²	3
In continuous operation since	1987
Time resolution	5 min

Guangzhou muon scintillant telescope is situated in Guangzhou city (23.60N,113.180 E) with altitude 20 meters. The local vertical geomagnetic cutoff rigidity is about 16.0 GV. The Guangzhou cosmic ray station belongs to the Center for Space Science and Applied Research, Chinese Academy of Sciences. Cosmic ray measurements in Guangzhou started in 1989 with twenty-four independent monitor units to detect muon flux in the vertical, east, west, south and north directions (SF=64, 32, 32, 32, 32 respectively). In 1991, the completely new data collecting system was implemented to collect 5-minute data. In 2008, the new fully automatic data collecting and pre-processing system was installed that uses, in particular, precise GPS timing and remote access control. The database contains 5-minute resolution data since 1991, and hourly data since 1987. The 5-minute resolution data and hourly data are provided in real time.

The multi-direction telescope used in GunganZhou station was set up in 1987. Its formal operation started in 1988. Located at 23.6N, 113.18E, GuangZhou station altitude is 20 meters above the sea and it's geomagnetic cutoff rigidity is 16GV. The scintillator meson telescope here is recommended standard equipment during the International Quiet Sun Year (IQSY). Compared with G-M meson telescope, it's advantages are: large receptive area, high statistical accuracy, Operating stabilization and long duration.

The scintillator telescope has an effective area of 3 m², and is consists of 24 independent probes. In each observation unit there are on 50×50×5 cm³ plastic scintillator, optical guide box and photomultiplier, 24 such units are installed in tow up and down layers. The distance between the layers is 89cm include 5cm lead to absorb the soft composition in cosmic ray. The joint ac-

tion of observation unit make it a telescope that can record signal form vertical, north, south, west and east.



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Объединить с предыдущим текстом.

Guangzhou -ST Muon Telescope

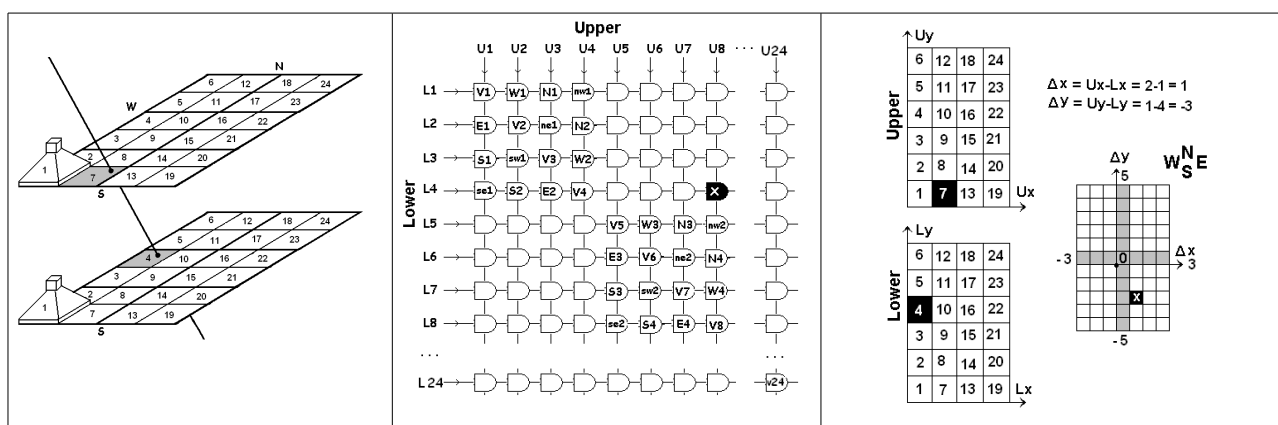
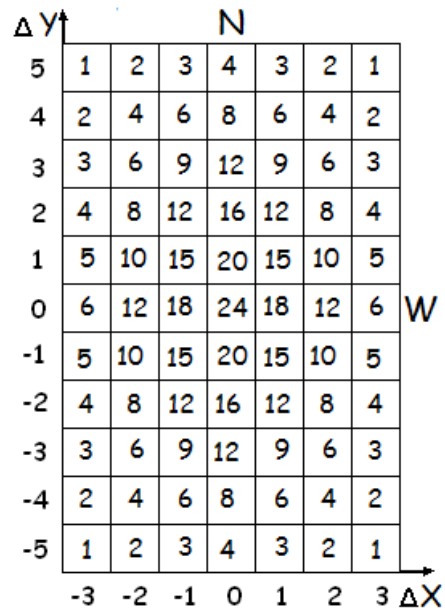


Рис. 1. Геометрия телескопа (левый), матрица совпадений (средний) и выделение всех независимых направлений регистрации (правый).

В верхней U и нижней L плоскости по $k_x=6$ и $k_y=4$ детекторов по каждой координате. Каждая плоскость содержит $k_x \times k_y$ детекторов, между которыми организовано $m=(k_x \times k_y)^2=576$ независимых двукратных совпадений. С помощью этих телескопов можно выделить $n=(2k_x-1) \times (2k_y-1)=77$ независимых направления прихода частиц.



Guangzhou

Telescope Name	Directional Telescope	Number of sub-telescopes	Count (imp/sec)	Count error (%/hour)	P_m (GV)	β (%/hPa)	Viewing Lat °N lon °E	
v0		12	54.7			-0.13		
n1		10	21.7			-0.13		
s1		10	22.5			-0.13		
e1		6	12.6			-0.13		
w1		6	13.6			-0.13		
ne2								
nw2								
se2								
sw2								
n3								
s3								
e3								
w3								
UpCarpet	2π							
DnCarpet	2π							

In DataBase http://www.cssdc.ac.cn/?Viewmore&dataset=GXL_TEL_5M

or in DataBase

<http://159.226.22.211/Service/Solar-Terrestrial-Space-Physics/Cosmic-Ray/Meson-Intensity/>

you can find 5 minute data for example:

(SF for V - 32, for E, W, S, N - 16; result in imp/5min)

Prepared by the CSSAR, CAS.

Please, sends comments and suggestions to chengyh@cssar.ac.cn

yymmdd hhmns V E W S N

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2011-12-31 00:00:00	534	238	280	442	425
2011-12-31 00:05:00	536	238	270	446	421
2011-12-31 00:10:00	531	241	274	443	426
2011-12-31 00:15:00	536	242	280	448	438
2011-12-31 00:20:00	537	246	272	438	437
2011-12-31 00:25:00	538	243	271	445	437
2011-12-31 00:30:00	534	244	279	448	425
2011-12-31 00:35:00	530	238	273	434	423
2011-12-31 00:40:00	543	239	274	440	425
2011-12-31 00:45:00	539	243	271	450	424
2011-12-31 00:50:00	536	245	269	440	433
2011-12-31 00:55:00	531	243	272	438	417
2011-12-31 01:00:00	540	250	269	442	429
2011-12-31 01:05:00	531	244	272	442	432

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2011-12-31 23:35:00	542	243	279	437	427
2011-12-31 23:40:00	543	247	286	435	437
2011-12-31 23:45:00	533	239	276	444	428
2011-12-31 23:50:00	538	250	271	445	426
2011-12-31 23:55:00	540	245	272	445	430