Sao Martinho Muon Multi-Directional SuperTelescope

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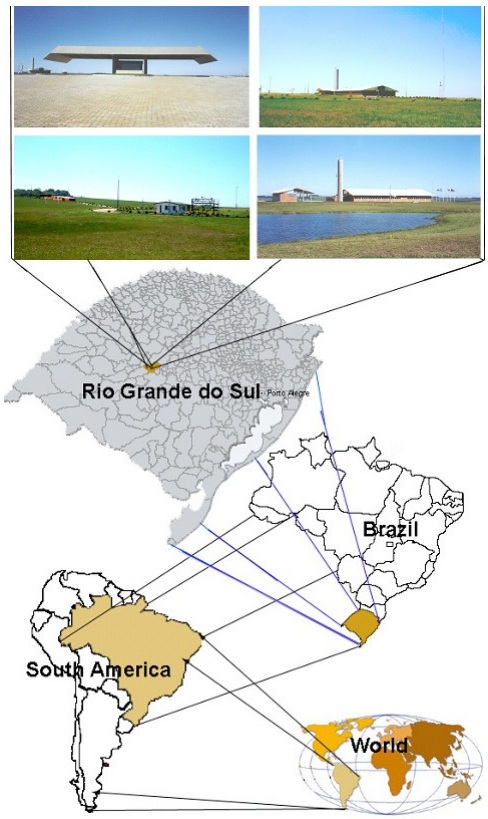
Basic informations:

Geographic latitude	**-29.44^{o} S**
Geographic longitude	**-53.81^{o} W**
Altitude	**488 m above sea level**
Standard pressure, mbar [hPa]	**1000**
Vertical geomagnetic cutoff rigidity	**GV**
Detector type	**7×4×2 plastic scintillate detectors (unit 1.0×1.0×0.05 m^3)**
X×Y×H, m	**7.0×4.0×1.72**
Площадь детектора, m^2	**28**
In continuous operation since	**December 2005**
Time resolution	**1 min**

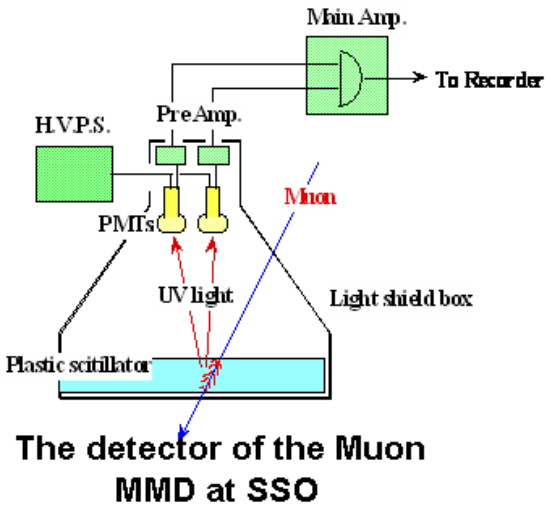
SOUTHERN REGIONAL SPACE RESEARCH CENTER – CRS/INPE
Panoramic view of the main building of the at Santa Maria, RS, Brazil
http://www.inpe.br/crs/



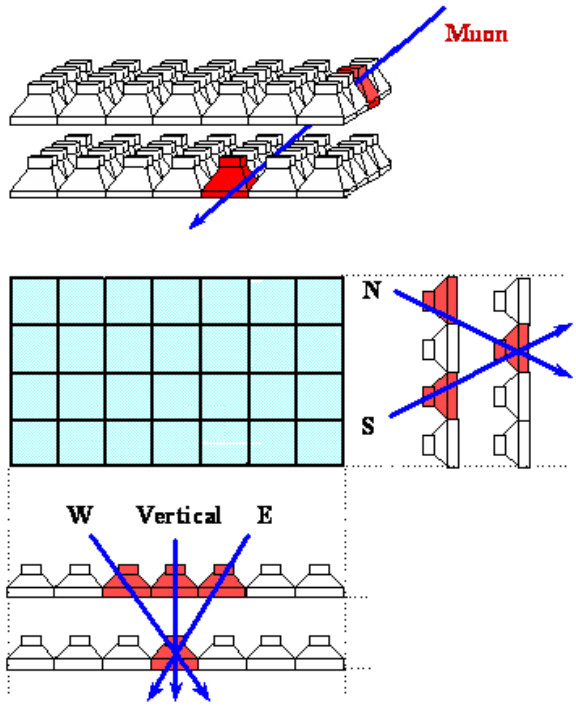
SOUTHERN SPACE OBSERVATORY SSO/CRS/INPE
Main gate and buildings 1, 2, 3, 5 and 6 at
Sro Martinho da Serra, RS, Brazil

The Brazilian Southern Space Observatory – Sso
Multi Directional Muon Detector - MMD (7x4 x2)
Small (**2x2m^2**) prototype detector at operated from March 2001,
upgraded (**7x4m^2**) operated since December 2005. Plan Expansion to **9x4m^2**.

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	0°	28	642	0.07	55.57	-0.12	-22.6	330.4
n1	30°	21	244	0.11	59.81	-0.12	5.3	325.3
s1	30°	21	252	0.11	59.09	-0.12	-18.3	347.2
e1	30°	24	283	0.10	61.70	-0.11	-10.7	358.5
w1	30°	24	283	0.10	58.30	-0.12	-29.1	298.0
ne2	39°	18	117	0.15	66.55	-0.11	10.3	350.3
nw2	39°	18	117	0.15	62.08	-0.12	-0.9	290.0
se2	39°	18	119	0.15	65.18	-0.11	-30.6	11.2
sw2	39°	18	119	0.15	62.34	-0.12	-56.8	304.0
n3	49°	14	80.7	0.17	78.97	-0.12	23.0	322.5
s3	49°	14	83.3	0.17	77.29	-0.12	-63.1	8.8
e3	49°	20	103	0.15	80.53	-0.11	-3.6	12.9
w3	49°	20	103	0.15	74.97	-0.12	-27.7	273.0
n4	64°		9.44	0.46	98.97	-0.12	33.3	321.5
s4	64°		9.72	0.46	96.87	-0.13	-68.6	32.0
e4	64°		20.8	0.30	105.0	-0.12	-0.7	20.0
w4	64°		24.4	0.30	98.77	-0.13	-23.7	257.9
Up carpet	2π							
Dn carpet	2π							



The detector of the Muon MMD at SSO



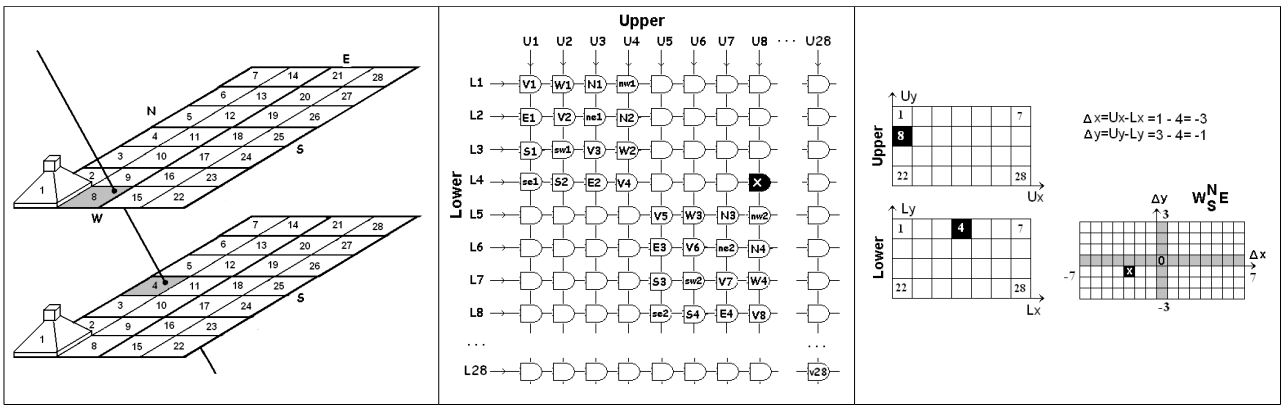


Рис. 1. Геометрия телескопа (левый), матрица совпадений (средний) и выделение всех независимых направлений регистрации (правый).

В верхней U и нижней L плоскости по k_X =7 и k_Y =4 детекторов по каждой координате. Каждая плоскость содержит $k_X \times k_Y$ детекторов, между которыми организовано $m=(k_X \times k_Y)^2 = 784$ независимых двукратных совпадений. С помощью этих телескопов можно выделить $n=(2k_X-1)\times(2k_Y-1)=91$ независимых направления прихода частиц.

See: http://www.bartol.udel.edu/~takao/