

Istituto Nazionale di Fisica Nucleare SEZIONE DI ROMA TOR VERGATA









ISTITUTO NAZIONALE DI ASTROFISICA NATIONAL INSTITUTE

INAF

FOR ASTROPHYSICS



Update on RPC activity for pathfinder

Full size chamber layout



- 1 LV cable
- 4 ethernet cables (signal) + 1 (DCS)

1 HV cable

RPC layout - ver. 2.1



Dimensions: 288 x 80 cm x cm Weight = 30 kg

Thermal coverage

• Thermal coverage for outdoor operations



- Prototype for small chamber designed and produced
- Test of temperature cycles ready to start







Layout for Milano test

LATERAL: 2 RPC layers with 1 Chamber each **2.8 m x 0.8 m**

Simulated Cosmic Muons for Milano test

100000 Muons simulated on **TOP RPC** (Area=1.28 m²) 5877 Muons triggered Geometrical Acceptance = **5.9%** Expected Coincidence rate = 100 hz/m² * 1.28 m² * 0.059 = **7.5 hz**

Pathfinder

Longitude [°]

Pathfinder

Pathfinder layout: possible options

Assumptions:

- tanks placed on a concrete basement and 6 RPCs placed in a slot of the basement (2 under the _ tank) 2-4 on the sides
- Something on the top (to be studied the possibility to place RPCs on top): simple baseline solution assume 2 small RPCs (50x50 cm²)

Baseline proposal

Possibility to trigger on several typologies of cosmic muons:

- from top to bottom
- From top to lateral

Possibility to trigger on showers according to pad multiplicity

Open issues

- To be defined which tank to be instrumented
 - According to logistic of installation
 - Which kind ? White black coated
- To be defined how to fix small RPCs on the tank:
 - Discussion with Ulisses

RPC on the bottom: concrete basement from Auger test

The support structure

Precast structure built at the observatory Transported to the field Installed in a couple of hours (Emptying/Filling the tank is more time consuming)

From a presentation of Lisboa Group

Next steps

- Tomorrow: SWGO Italia @ Milano

 - We will present our proposal for RPC in pathfinder to get feedback
- In two weeks: SWGO site WG meeting
 - Presentation will be given to SWGO
 - Proposal of layout
 - Request of spaces for DAQ and Power system
 - Power budget
 - costs
- Hardware activities ongoing in ToV/LNF
 - Full size chamber completed
 - DAQ under preparation
 - Test of DAQ and RPC in view of Milano test
 - Tests in LNF with pure TFE/HFO gas

• Discussion on status of project and financial requests to July INFN Gr2 Meeting