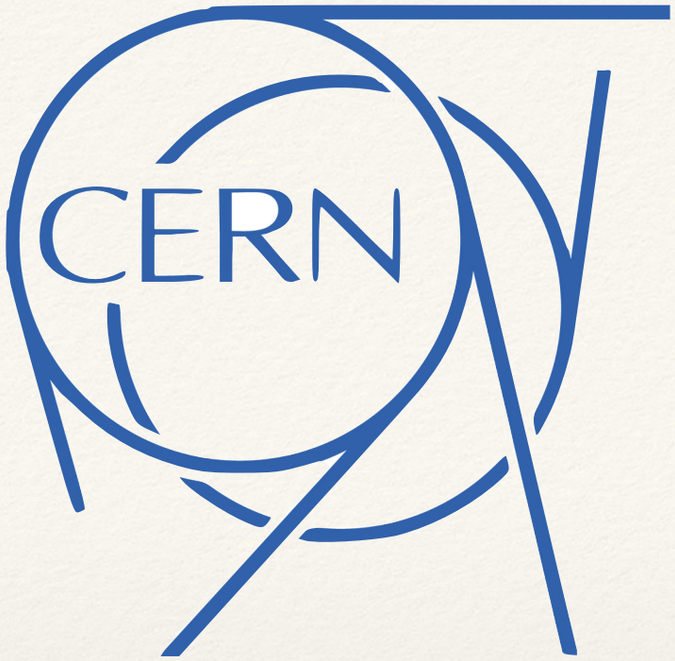


Paris Moschovakos

3D DCS of the MicroMegas Detectors of the New Small Wheel

08/05/2014

Ευρωπαϊκή Ένωση
Ευρωπαϊκό Κοινωνικό Ταμείο

ΕΠΙΧΕΙΡΗΣΙΑΚΟ ΠΡΟΓΡΑΜΜΑ
ΕΚΠΑΙΔΕΥΣΗ ΚΑΙ ΔΙΑ ΒΙΟΥ ΜΑΘΗΣΗ
επένδυση στην κοινωνία της γνώσης
ΥΠΟΥΡΓΕΙΟ ΠΑΙΔΕΙΑΣ ΚΑΙ ΘΡΗΣΚΕΥΜΑΤΩΝ
ΕΙΔΙΚΗ ΥΠΗΡΕΣΙΑ ΔΙΑΧΕΙΡΙΣΗΣ

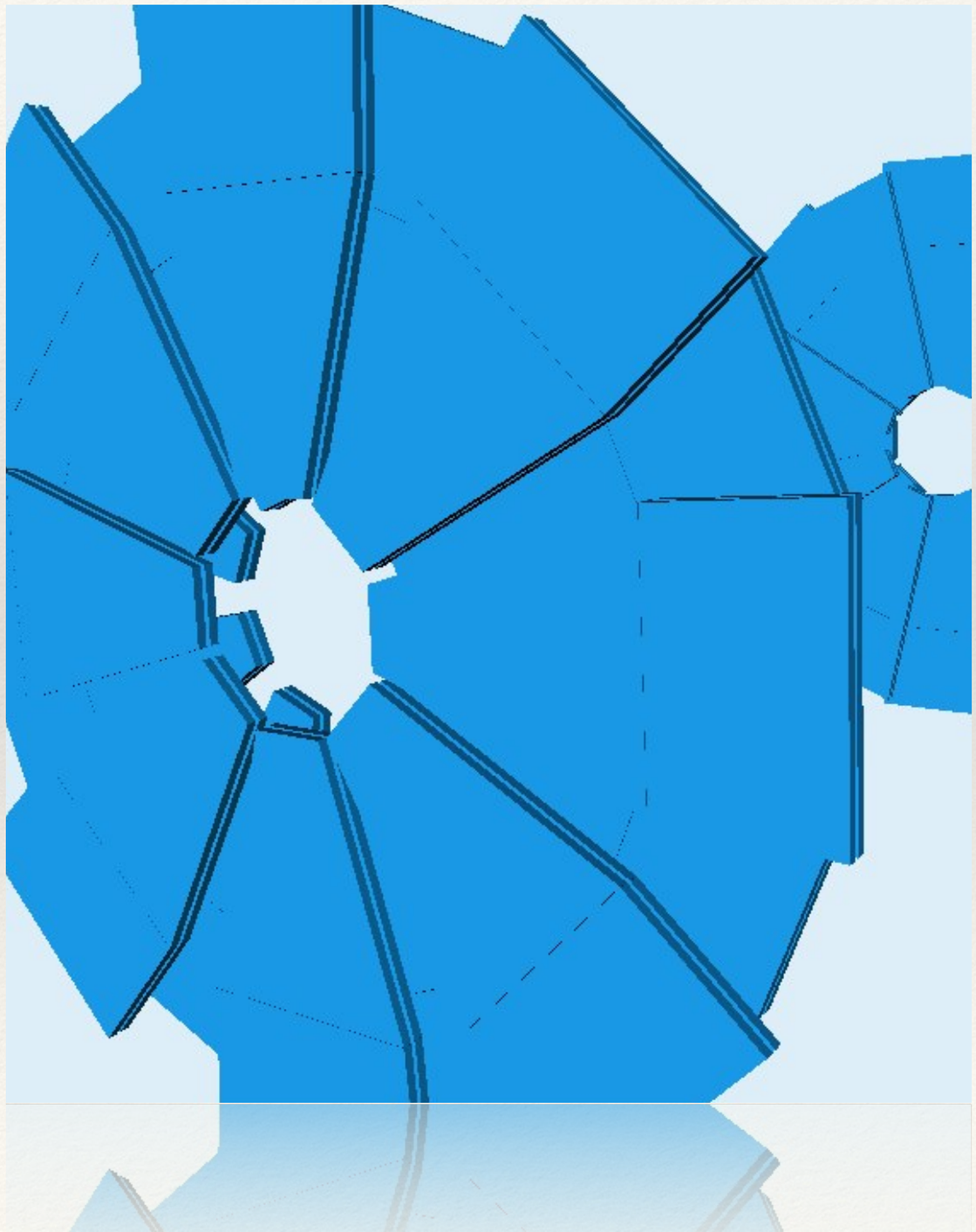
ΕΣΠΑ 2007-2013
πρόγραμμα για την ανάπτυξη
ΕΥΡΩΠΑΪΚΟ ΚΟΙΝΩΝΙΚΟ ΤΑΜΕΙΟ

Με τη συγχρηματοδότηση της Ελλάδας και της Ευρωπαϊκής Ένωσης

Contents

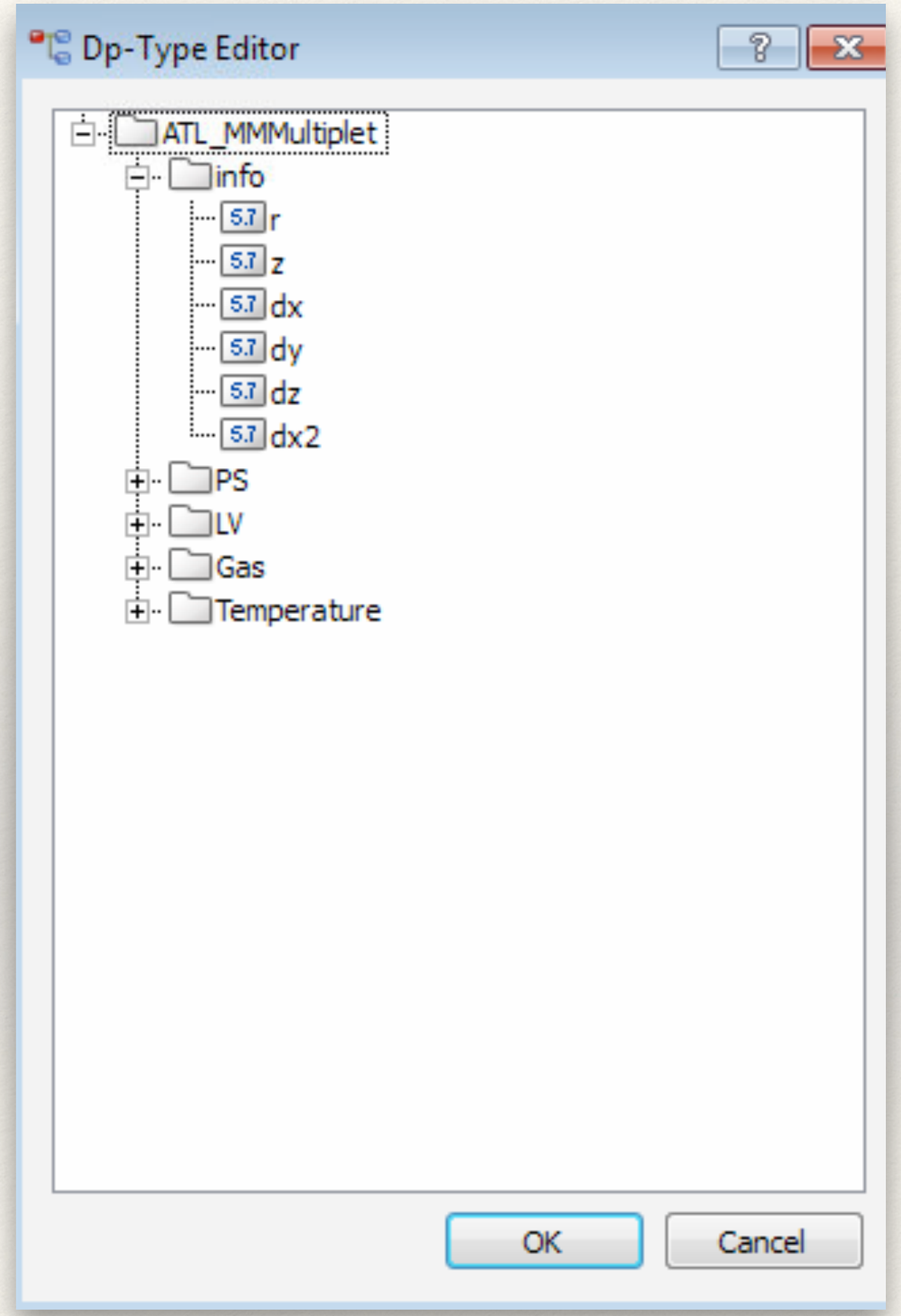
Overview of the 3D Control System

- Simplified visualisation
- Quicker detection of problematic multiplets
- Easy integration to the existing DCS of ATLAS



MM Multiplets 3D Mapping

- Up to date information about dimensions and coordinates from Daniel Lellouch (04/02/2014) “sTGC & MM Parameter Book”
- Storage of mapping information in DPs at RAIMA database
- 768 DPEs ≈ 14.8 MB
- DPT that was utilised “ATL_MMMultiplet”


Dp-Type Editor
ATL_MMMultiplet
info
r
z
dx
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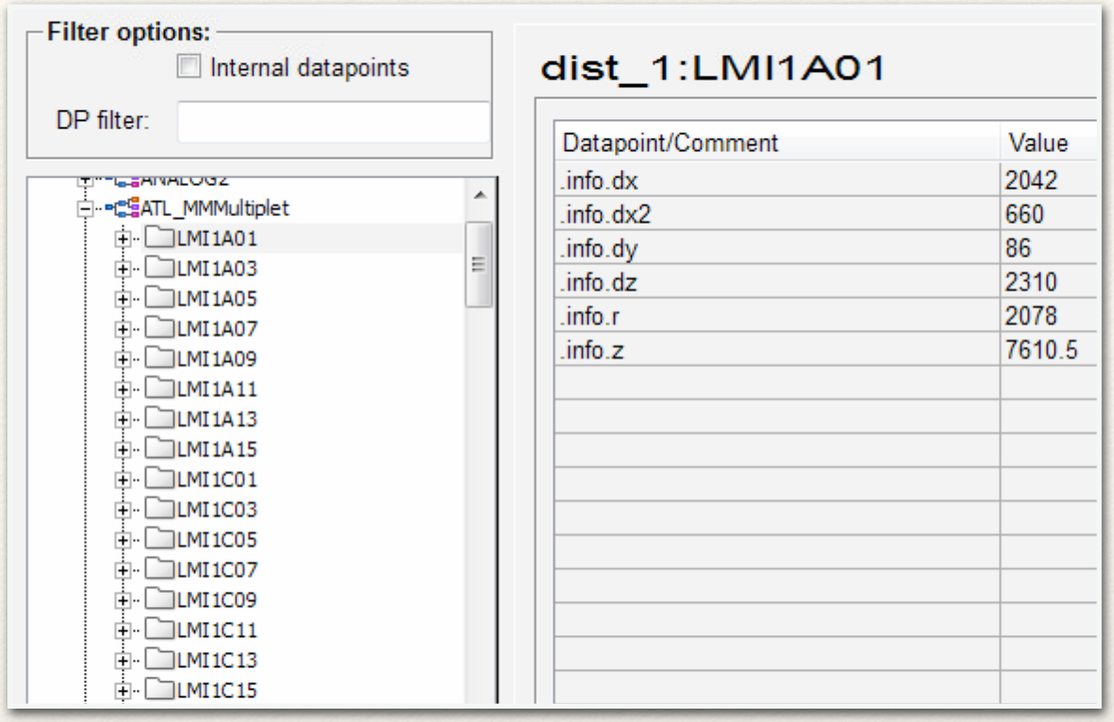
dz
dx2
PS
LV
Gas
Temperature
OK
Cancel


Filter options:
Internal datapoints
DP filter:
ATL_MMMultiplet
LMI1A01
LMI1A03
LMI1A05
LMI1A07
LMI1A09
LMI1A11
LMI1A13
LMI1A15
LMI1C01
LMI1C03
LMI1C05
LMI1C07
LMI1C09
LMI1C11
LMI1C13
LMI1C15
dist_1:LMI1A01
Datapoint/Comment
Value
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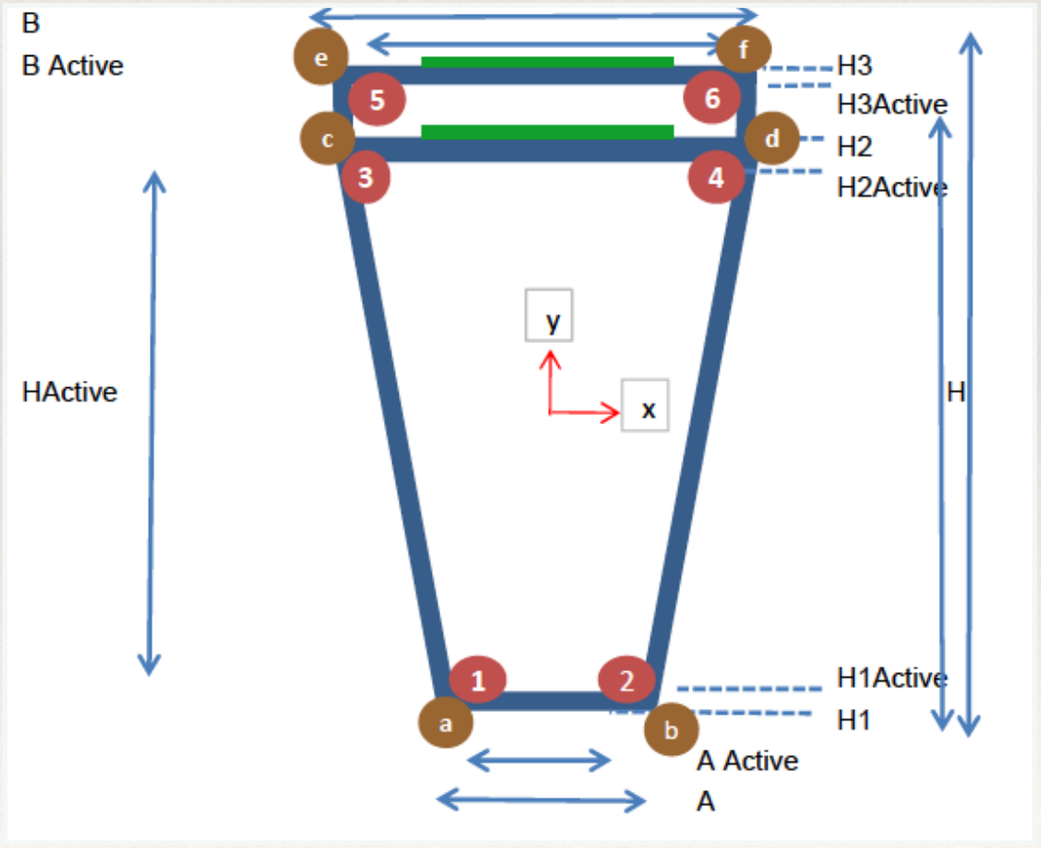
2078
.info.z
7610.5


B
B Active
HActive
H3
H3Active
H2
H2Active
H
H1Active
H1
A Active
A
a
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c
d
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f
1
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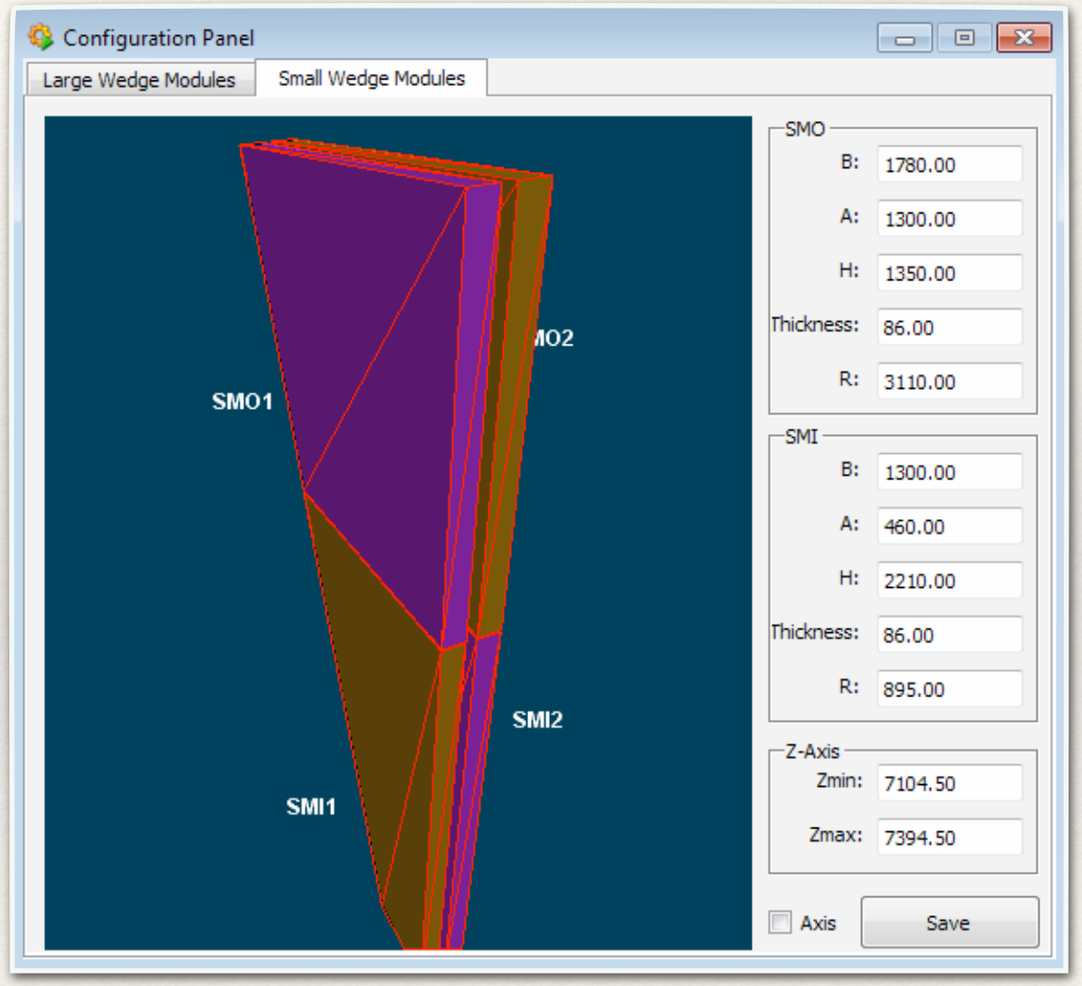
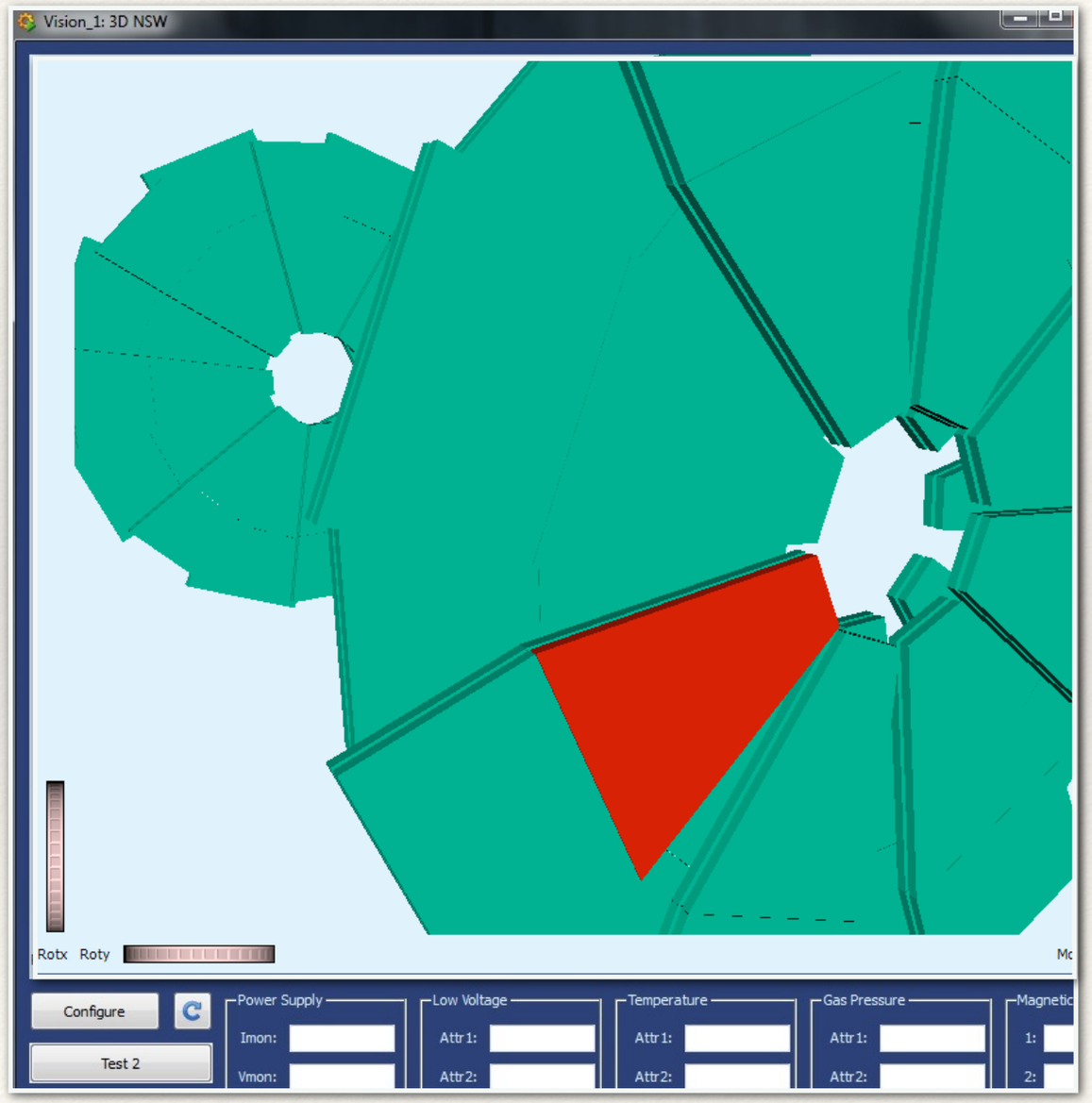
6
y
x

Configuration Tool

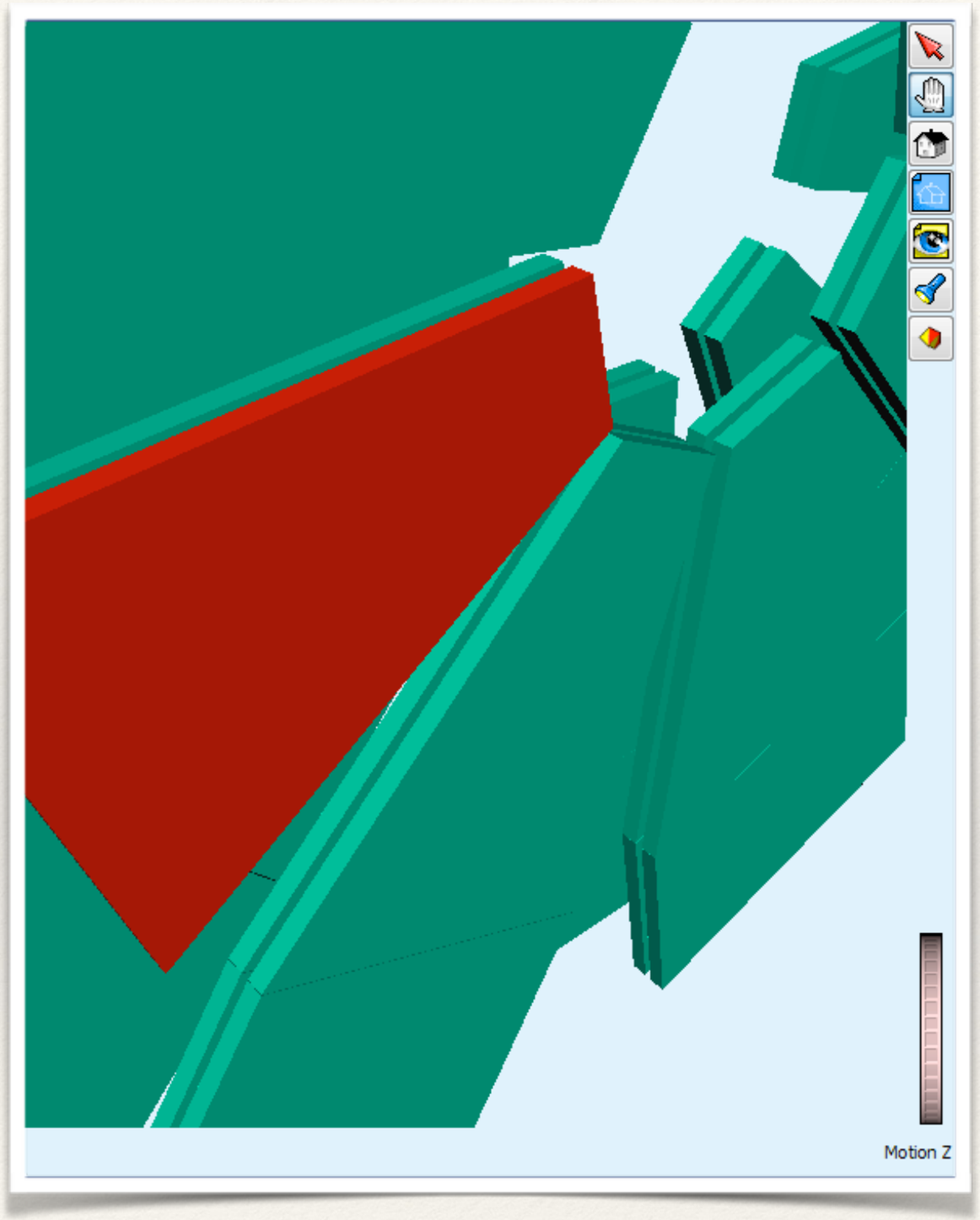
- One step wizard for updating the DPs
- Large/Small sector multiplet configuration tabs
- Simplicity, efficiency

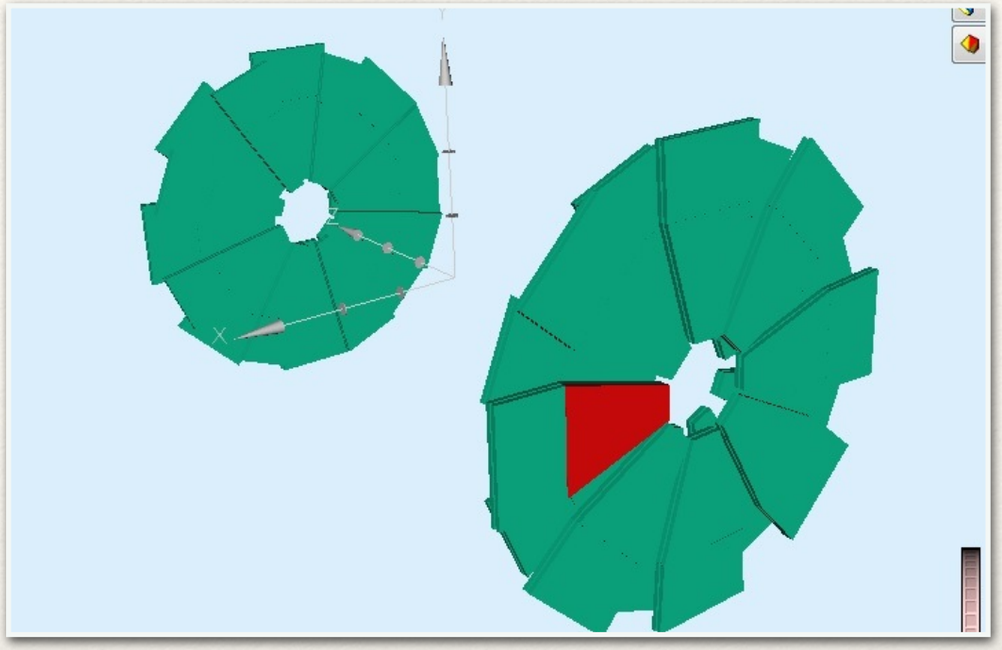


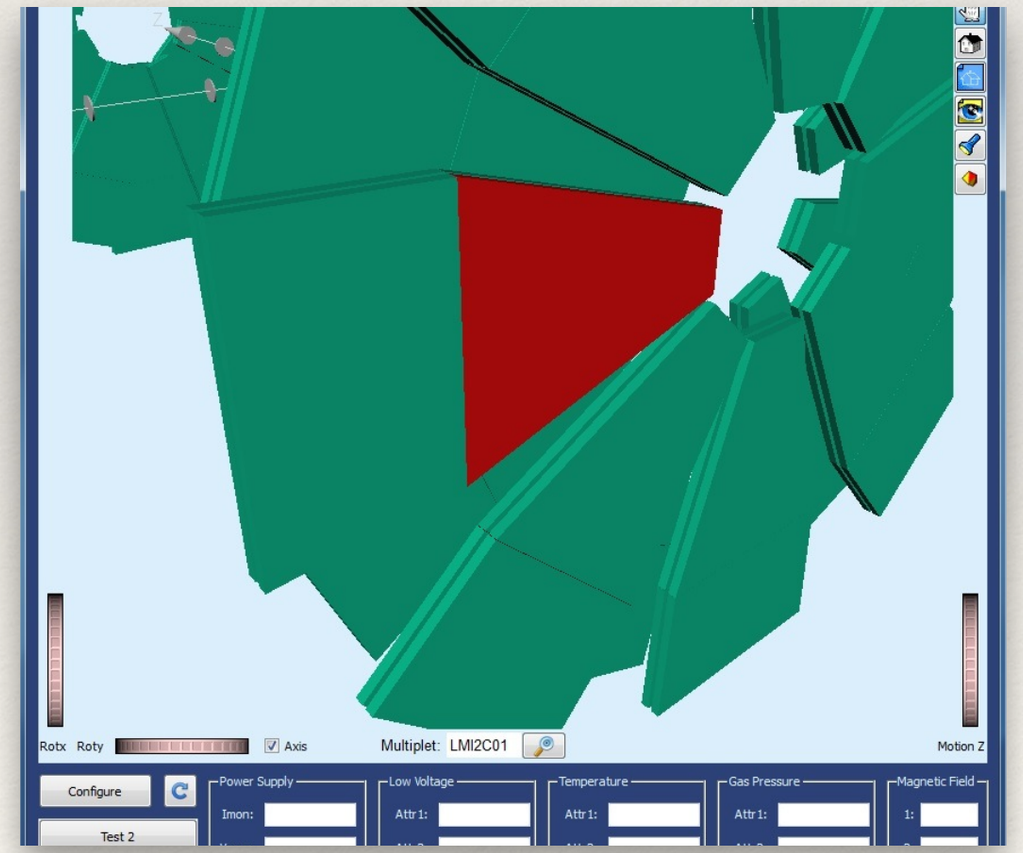
The Main Panel



- 3D Navigation (+seek to multiplet)
- Intuitive use
- Multiplet info frames for the HV, LV, Gas, Temp, Magnetic Field
- Minimum requirements are only the DPT and the FSM of the MicroMegas multiplets, not the DPs
- No hardware, no problem

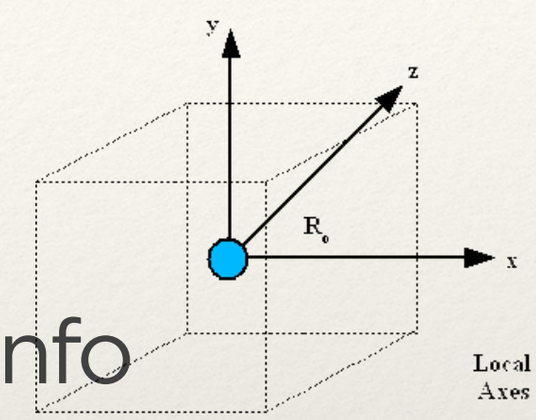

Motion Z

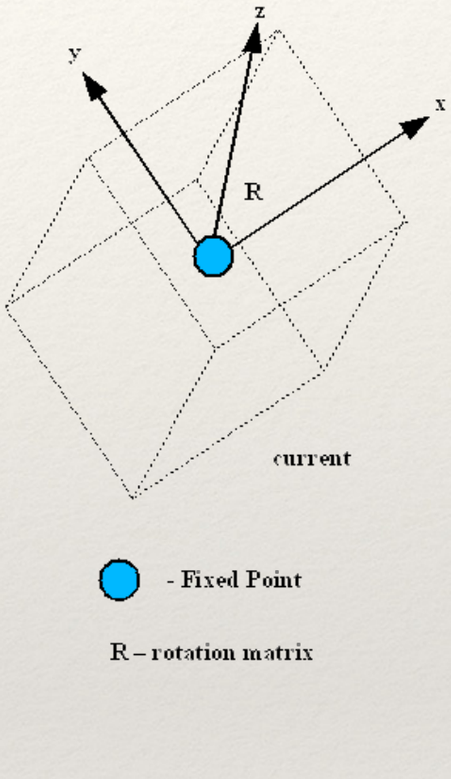



Rotx
Roty
Axis
Multiplet:
LMI2C01
Motion Z
Configure
Test 2
Power Supply
Imon:
Low Voltage
Attr 1:
Temperature
Attr 1:
Gas Pressure
Attr 1:
Magnetic Field
1:

The Rotation Function

- Retrieves raw data
- Calculates appropriate mapping info
- Creates the basic rotation matrices
- Multiplies accordingly
- Returns the total rotation matrix
- Draws the object





$$R_x(\theta) = \begin{bmatrix} 1 & 0 & 0 \\ 0 & \cos\theta & -\sin\theta \\ 0 & \sin\theta & \cos\theta \end{bmatrix}$$

$$R_y(\theta) = \begin{bmatrix} \cos\theta & 0 & \sin\theta \\ 0 & 1 & 0 \\ -\sin\theta & 0 & \cos\theta \end{bmatrix}$$

$$R_z(\theta) = \begin{bmatrix} \cos\theta & -\sin\theta & 0 \\ \sin\theta & \cos\theta & 0 \\ 0 & 0 & 1 \end{bmatrix}$$

Summary - What's next

- Expansion ready
- Follows closely JCOP guidelines
- Complies with Naming, Look & Feel Conventions

(Under development)

- Make MM multiplets FSM ready
- Expand to TGCs
- The hardware simulator
- Addition of features