# AMS TIM and General Meeting TRD Integration Status Report / Aachen Activities



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# AMS-02 TRD

 $p^+$ -rejection  $> 10^2$  (10 - 300 GeV)

Chosen Configuration for 60 cm height: 20 Layers each existing of

- 22 mm fleece
- $\varnothing$  6 mm straw tubes (Xe/CO<sub>2</sub> (80/20))





Physics AC-I

AMS-02 TRD Straw Modules: 16 straws at 6mm  $\varnothing$  with 30  $\mu$ m W-Au wire

328 Straw Modules (5248 Straws, L = 860 - 2010 mm)



# **Straw Module Production: Gastightness**



328 Straw Modules: Safety Factor for TRD:  $\sim 8$ 8 × 3y  $\sim 24$  years operation on ISS



Physics AC-I 3

# Measurement of Gas Gain with Fe<sup>55</sup> source 98



Mean: 5720.69 RMS: 63.90 c:\ggdata\progs\027\_3S.pas

Straw										
1	2.1	1.6	-2.1	1.0	1.4	1.9	-0.3	0.5	1.6	0.5
2	-0.8	1.2	0.0	-0.7	1.2	1.0	1.7	-0.Z	1.9	1.3
3	-0.4	-0.5	0.8	-1.3	-0.3	1.6	2.4	0.7	2.9	2.4
4	-0.4	-1.0	-0.7	-0.5	-1.6	-1.2	0.4	0.5	0.4	0.7
5	-0.3	0.2	-1.4	0.2	0.3	0.1	0.5	0.8	1.5	0.1
6	-0.4	0.7	-1.7	-0.1	0.4	-1.3	-0.2	1.4	-0.8	-1.Z
7	-1.1	0.9	-1.9	-1.1	0.3	-0.3	-1.1	1.4	0.6	-0.0
8	-0.4	-0.1	-1.2	-0.8	-0.0	-2.0	0.4	1.4	-1.4	-1.Z
9	-0.1	-0.3	-0.2	-0.7	-0.8	-1.4	0.2	1.4	-1.2	-0.Z
10	-0.1	0.6	-2.5	-0.3	1.0	0.0	-0.5	0.6	1.2	-1.3
11	-1.7	-0.6	-1.1	-2.3	0.3	0.1	-0.6	-0.3	0.6	0.3
12	0.2	-0.9	-2.8	-0.7	-0.9	-0.5	-1.0	-0.5	-0.4	-1.3
13	-0.3	0.6	-2.3	-0.3	1.4	-0.5	-2.0	0.2	0.5	-1.1
14	-0.Z	0.4	-0.3	0.2	0.3	0.6	-0.1	1.1	0.8	1.4
15	-2.2	-0.8	0.1	-0.6	-1.0	0.5	0.9	-0.8	2.0	1.9
16	0.8	1.3	-1.1	2.1	2.4	0.6	0.2	1.7	1.0	-1.2





# Average variation of gas gain: 1.48%



#### **AMS-02 TRD Integration of 328 Straw Modules**



Measurement of • Gastightness

- Gasgain using Fe<sup>55</sup>-source  $\hookrightarrow$  100  $\mu{\rm m}$  mechanical precision



LABABABABABABA





# **TRD-Octagon - 3D-Measurement**





 $100 \mu m$  shimming steps







Mylar Foil protecting Straw Modules





Inner  $90^{\circ}$  Fixation



Inner  $45^{\circ}$  Fixation



Bulkhead Fixation



Outer 45° Fixation







# Gasgain Measurement







Charge-Sensitive-Preamplifier-Readout



 $Fe^{55}$  Signal































#### **AMS-02 TRD-Temperature Sensor Integration**



Temperature Sensors 20C,20H Upper Bulkhead X-, Layer 18+19 Temperature Sensors 14C+H, 16C+H, 18C+H Middle Bulkhead Y-, Layer 6+7, 10+11, 14+15 Temperature Sensors 12C,12H Lower Bulkhead X-, Layer 2+3,



#### **AMS-02 TRD-Temperature Sensor Integration**



Temperature Sensors on Bulkheads installed Temperature Sensors on Octagon Walls @ Layer 6

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# **AMS-02 TRD-Straw Module Longterm Test**





#### **AMS-02 TRD-Straw Module Longterm Test**



 ${
m CO}_2-{
m Konzentration}$  changed from 20 to 15 %





# Conclusion

# TRD Integration:

- Straw Modules of Layer 1-6 installed
- Temperature Sensors Bulkheads installed
- Temperature Sensors Octagon Walls
   @ Layer 6

Integration will be finished end of 2005



TRD Straw Module longterm test  $\approx$  8000 h

- Modules gastight
- Gasgain monitored Changes due to CO<sub>2</sub>decrease

