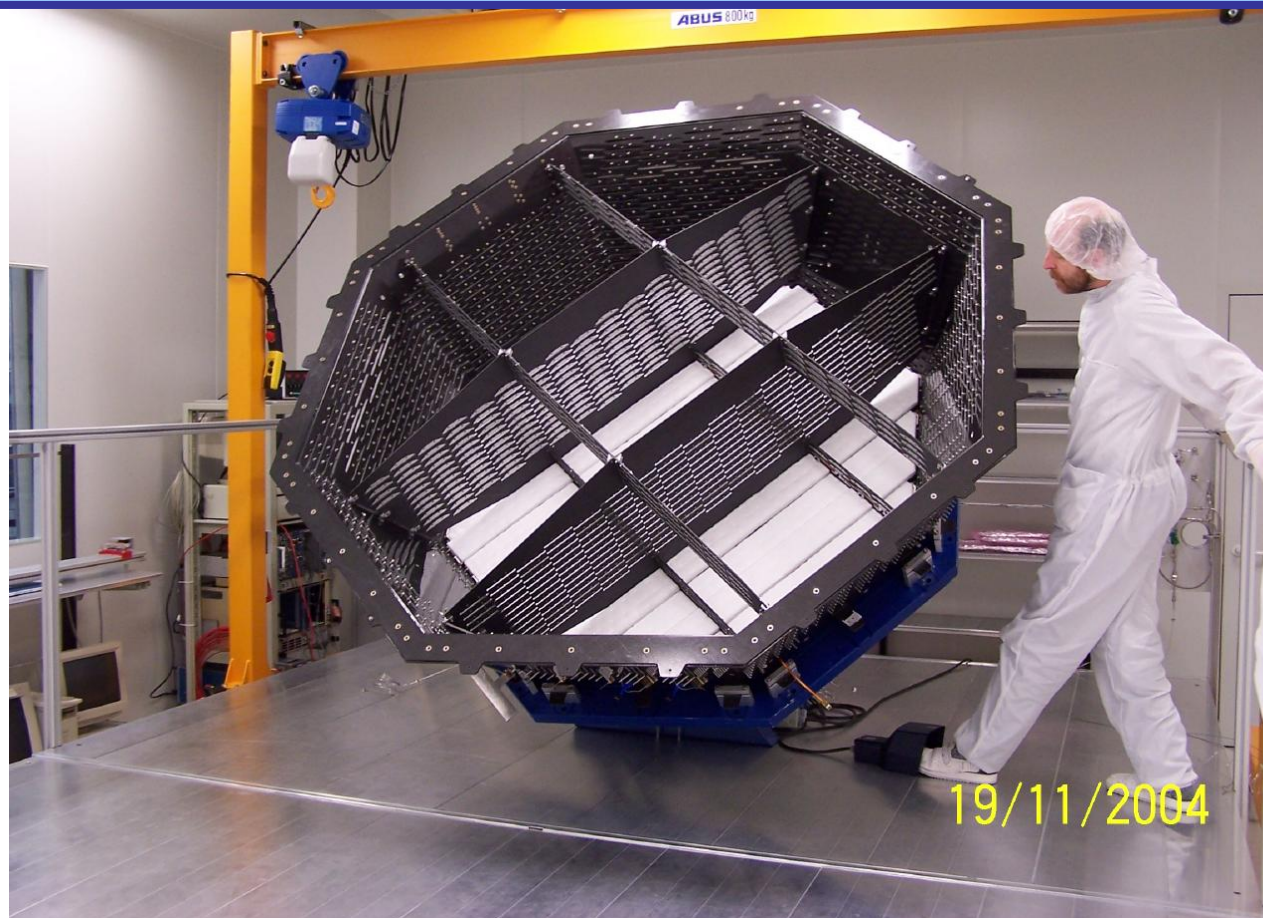


AMS TIM & General Meeting

TRD Integration Status Report



Th. Kirn, F. Dömmecke, M. Wlochal
I. Phys. Institute B, RWTH Aachen
CERN, 25th October 2005

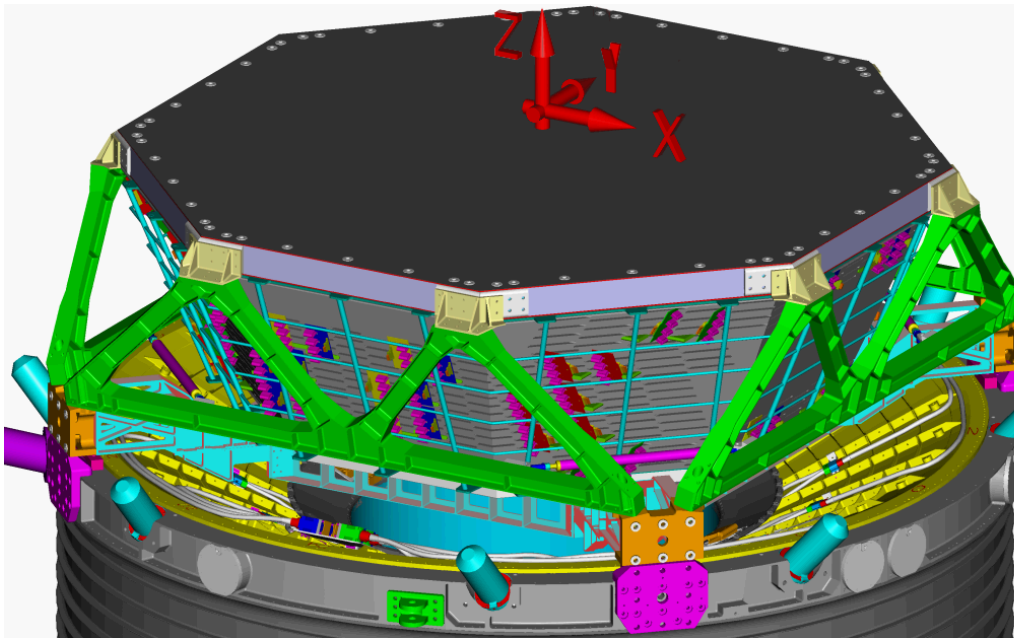
AMS-02 - TRD

p^+ rejection $>10^2$ 1-300 GeV $0.5\text{m}^2\text{sr}$

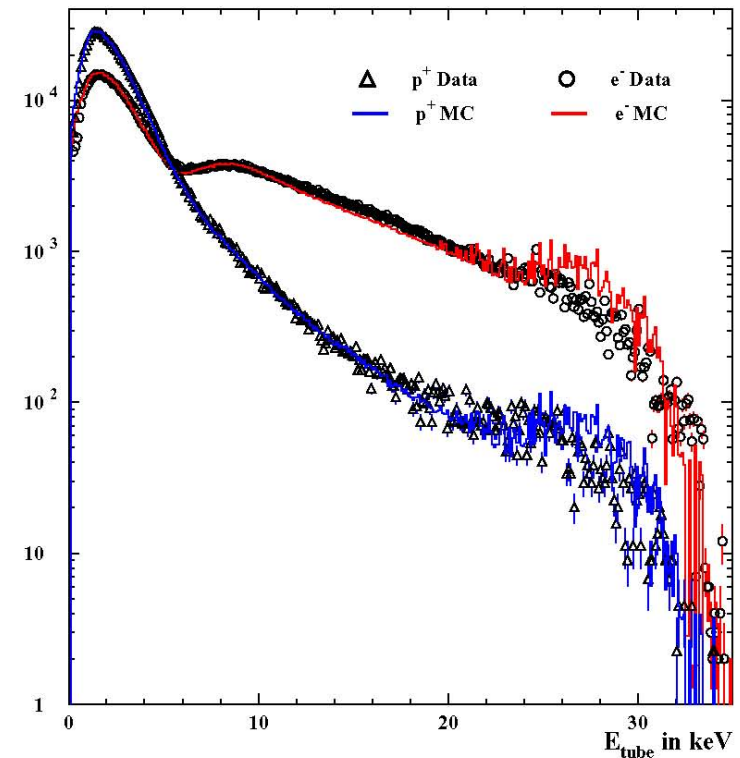
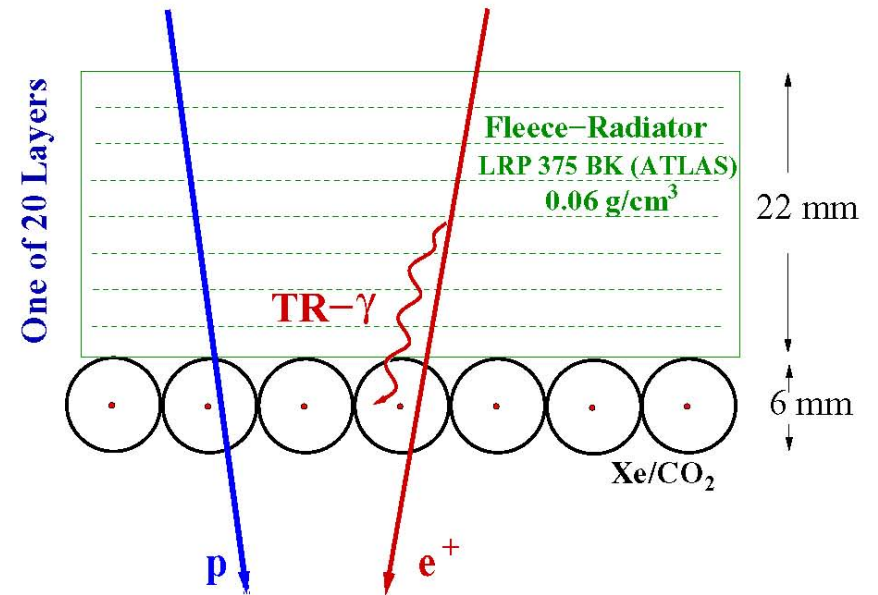
Chosen configuration for 60 cm height:

20 Layers each existing of:

- 22 mm fibre fleece
- $\varnothing$ 6 mm straw tubes (Xe/CO₂ 80%/20%)



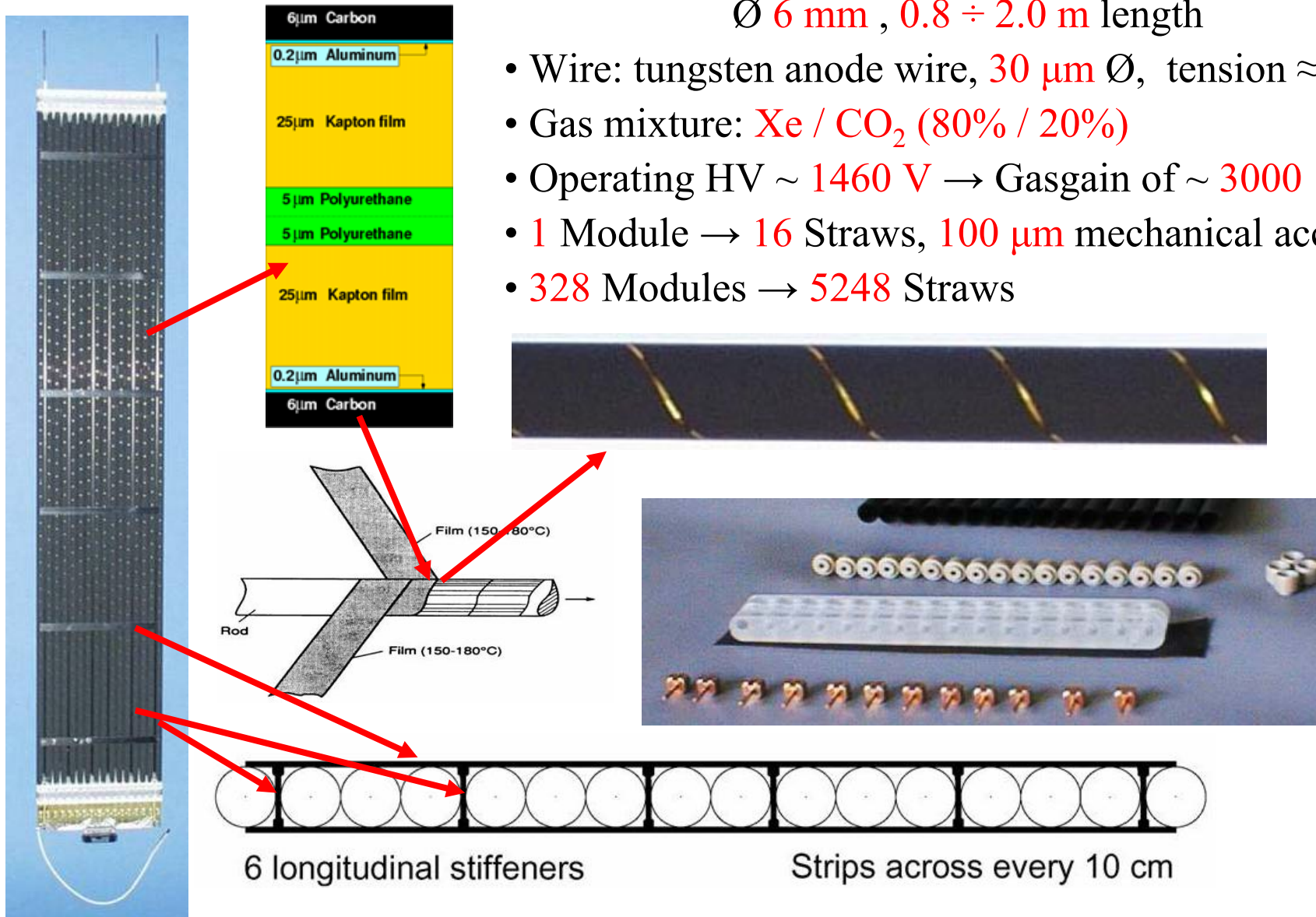
Th. Kirn



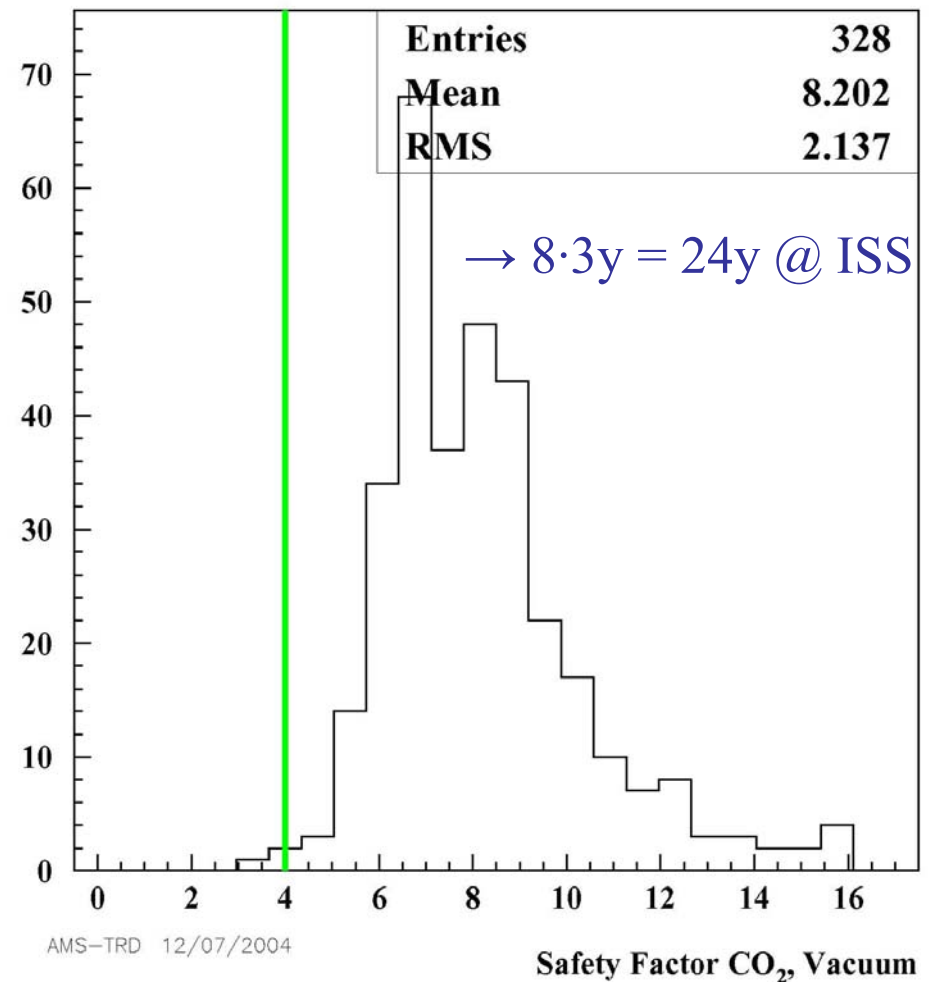
Straw Module

Straw tube proportional counter modules:

- Straw tubes: $72\ \mu\text{m}$ multilayer aluminium kapton foil, $\varnothing\ 6\ \text{mm}$, $0.8 \div 2.0\ \text{m}$ length
- Wire: tungsten anode wire, $30\ \mu\text{m}\ \varnothing$, tension $\approx 100\ \text{g}$
- Gas mixture: Xe / CO_2 (80% / 20%)
- Operating HV $\sim 1460\ \text{V} \rightarrow$ Gasgain of ~ 3000
- 1 Module $\rightarrow 16$ Straws, $100\ \mu\text{m}$ mechanical accuracy
- 328 Modules $\rightarrow 5248$ Straws



TRD: Flight Module Gastightness



CO₂ Leaktest in Vacuum

1m_{CH} = 16 straws of 1m [+2 endpcs]

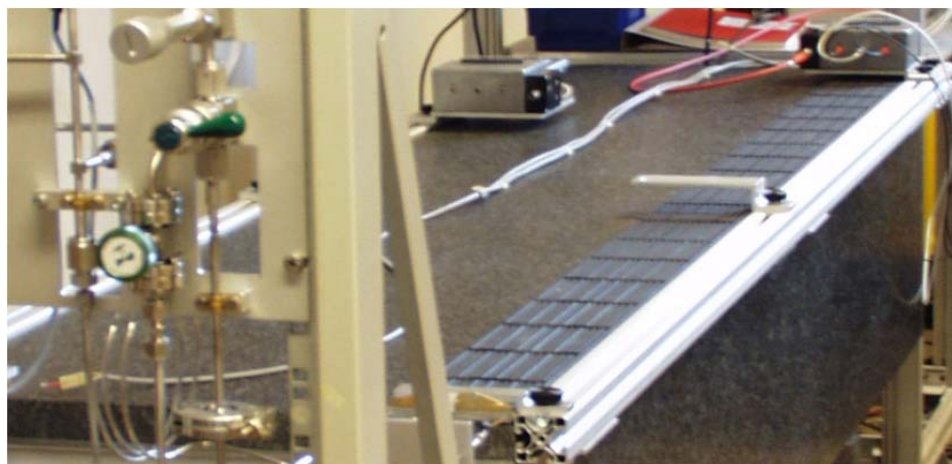
Straws @ 1bar:

Typ. Module [1.5m] :

$1.85 \cdot 10^{-5}$ l mbar/s/m_{CH} $\equiv$ SF 13.7

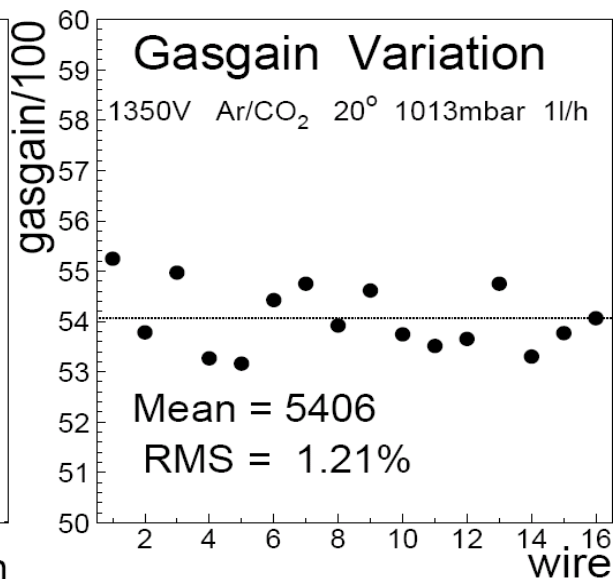
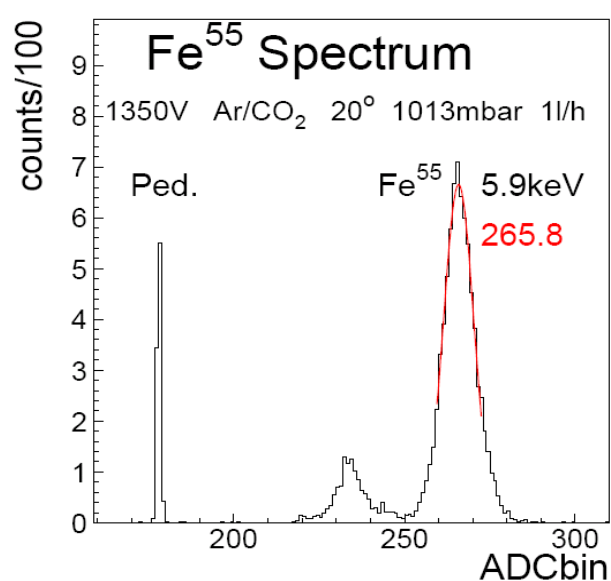
$3.1 \cdot 10^{-5}$ l mbar/s/m_{CH} $\equiv$ SF 8.2

TRD: Fe⁵⁵ - Gasgain Flight Modules

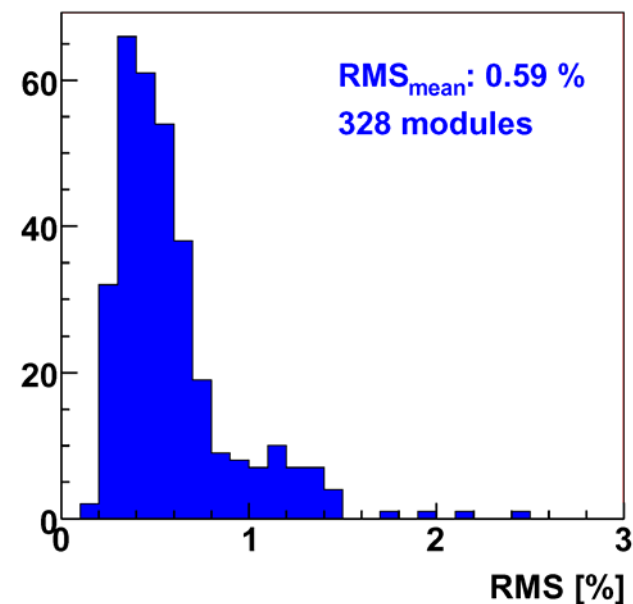


Ch160 on Nomex Shim 0.6mm Gain 6098 RMS 150

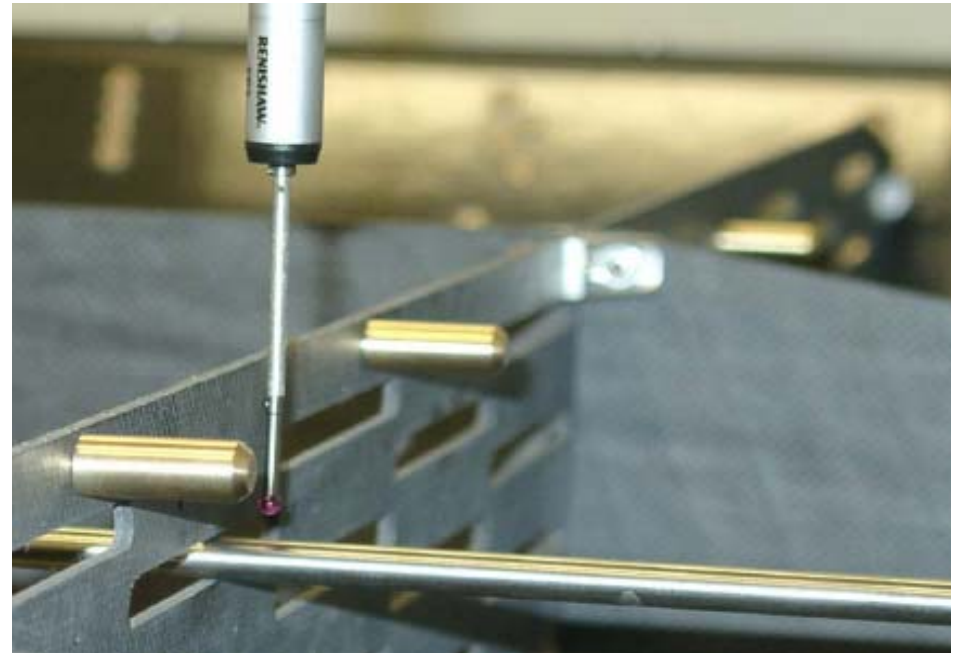
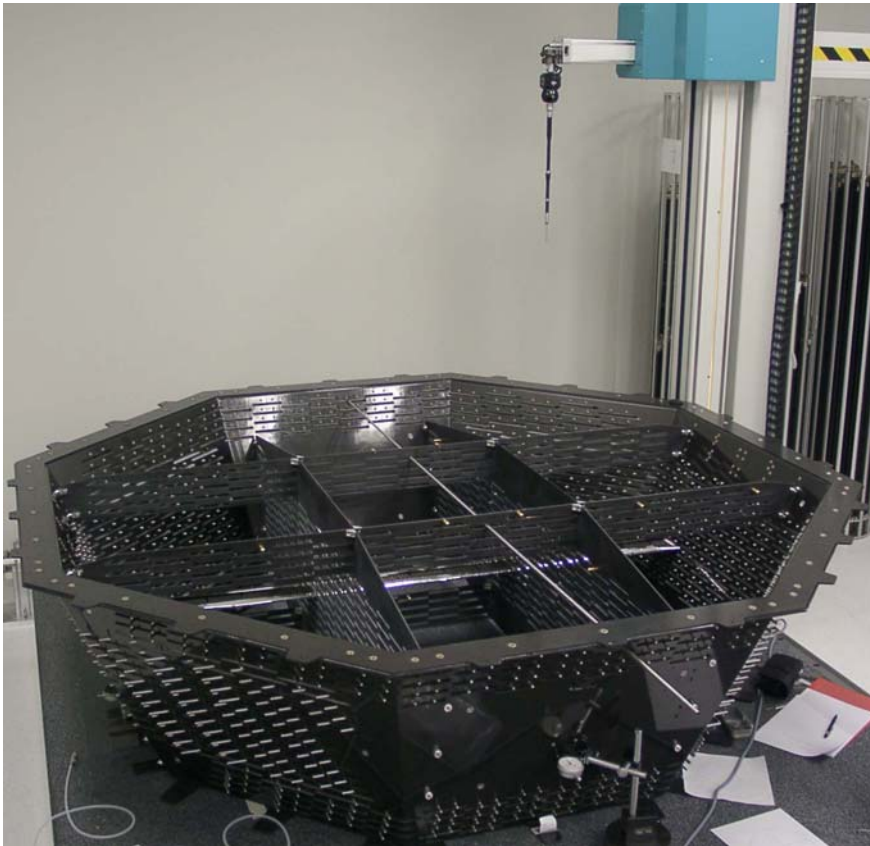
0.1	0.3	0.5	0.7	0.9	1.1	1.3	1.5	1.7	1.9m	Straw
3.2	1.5	4.2	1.8	5.7	7.1	5.2	4.2	0.2	-0.9	1
0.1	-0.1	0.2	1.0	4.1	3.8	2.9	1.8	-1.2	-2.4	2
-2.0	-0.7	0.2	0.5	0.1	3.2	4.2	-0.6	-2.9	-3.8	3
-2.6	-1.3	-2.1	0.4	0.6	2.5	2.8	-0.6	-2.8	-4.6	4
-2.9	-3.3	-1.4	-1.1	0.8	3.2	1.7	0.7	-3.0	-3.7	5
-3.7	-1.4	-4.0	-1.2	-0.9	1.4	2.8	-0.6	-1.9	-4.7	6
-1.9	-2.6	-1.1	-2.1	0.7	2.7	1.9	0.6	-2.9	-3.0	7
-2.4	-0.5	-1.0	0.8	1.1	2.3	2.1	-0.6	-2.0	-3.6	8
0.6	-1.0	1.0	0.4	5.8	5.6	1.6	2.8	-1.1	-1.1	9
-0.1	-1.2	0.3	0.5	2.8	3.6	0.9	0.8	-1.4	-2.7	10
-2.1	-0.6	-1.4	-1.0	0.4	1.6	2.1	-1.7	-3.6	-4.4	11
-2.3	-1.7	-0.5	-1.5	1.3	2.0	-0.1	-0.3	-4.8	-5.0	12
-2.1	-0.3	-0.6	0.7	2.2	1.9	3.4	0.4	-3.1	-5.1	13
-0.7	-1.4	0.8	-1.1	1.9	4.2	1.7	0.5	-3.0	-3.1	14
-1.6	-0.1	-2.1	1.8	2.6	2.2	2.7	1.0	-0.7	-2.9	15
-1.9	1.3	-0.7	2.4	1.6	3.1	4.5	1.6	-0.6	-4.2	16



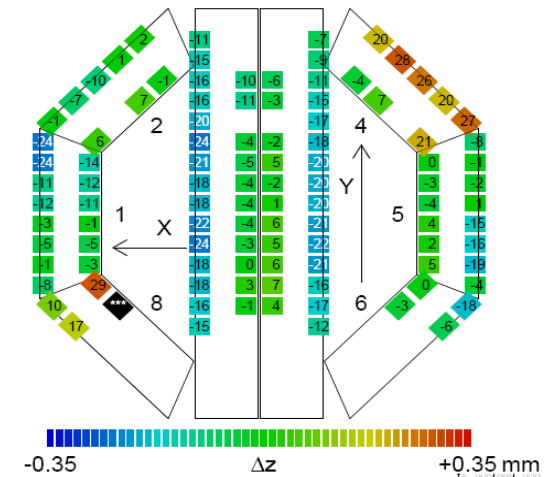
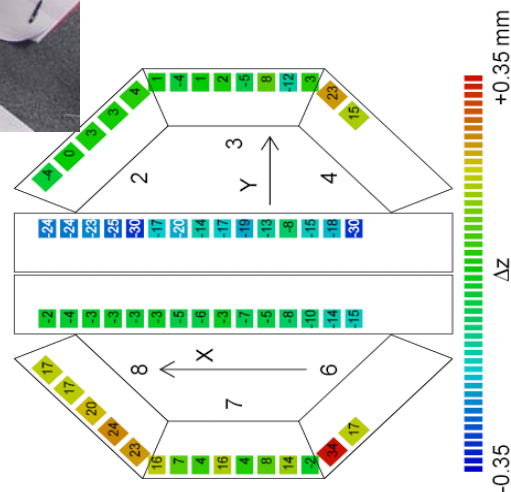
RMS gasgain



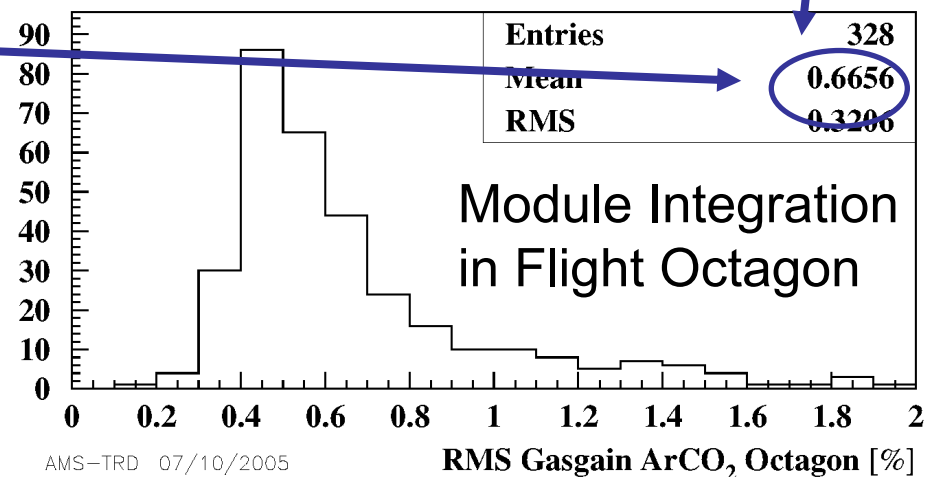
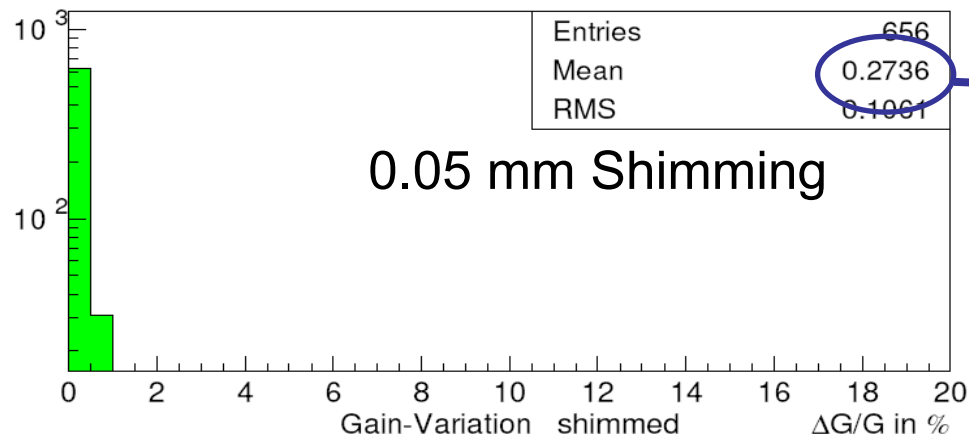
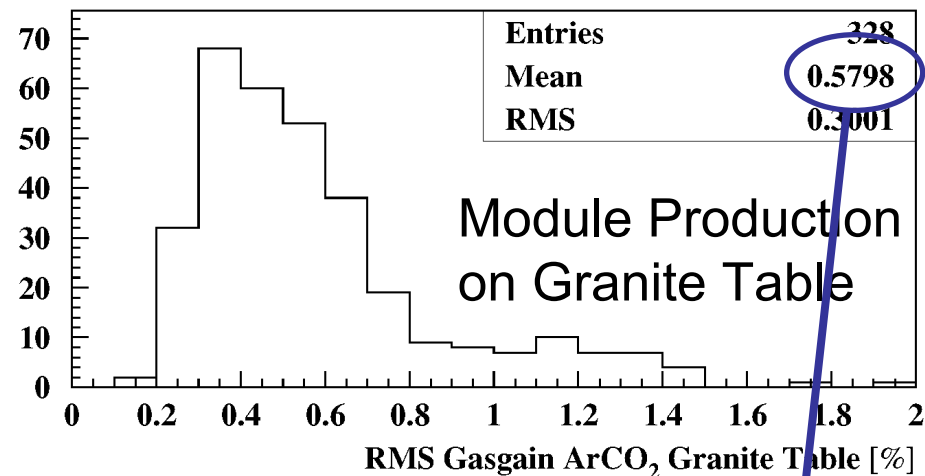
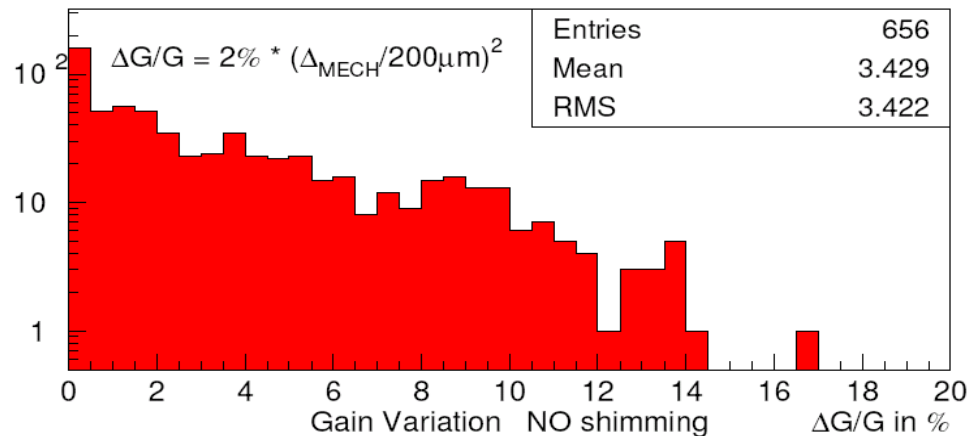
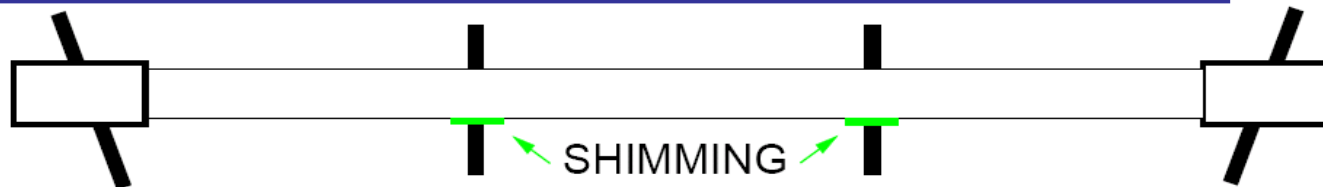
TRD: Octagon Structure: 3D-Measurement



Upper and lower 4 layers $\parallel$ B
Middle 12 layers $\perp$ B



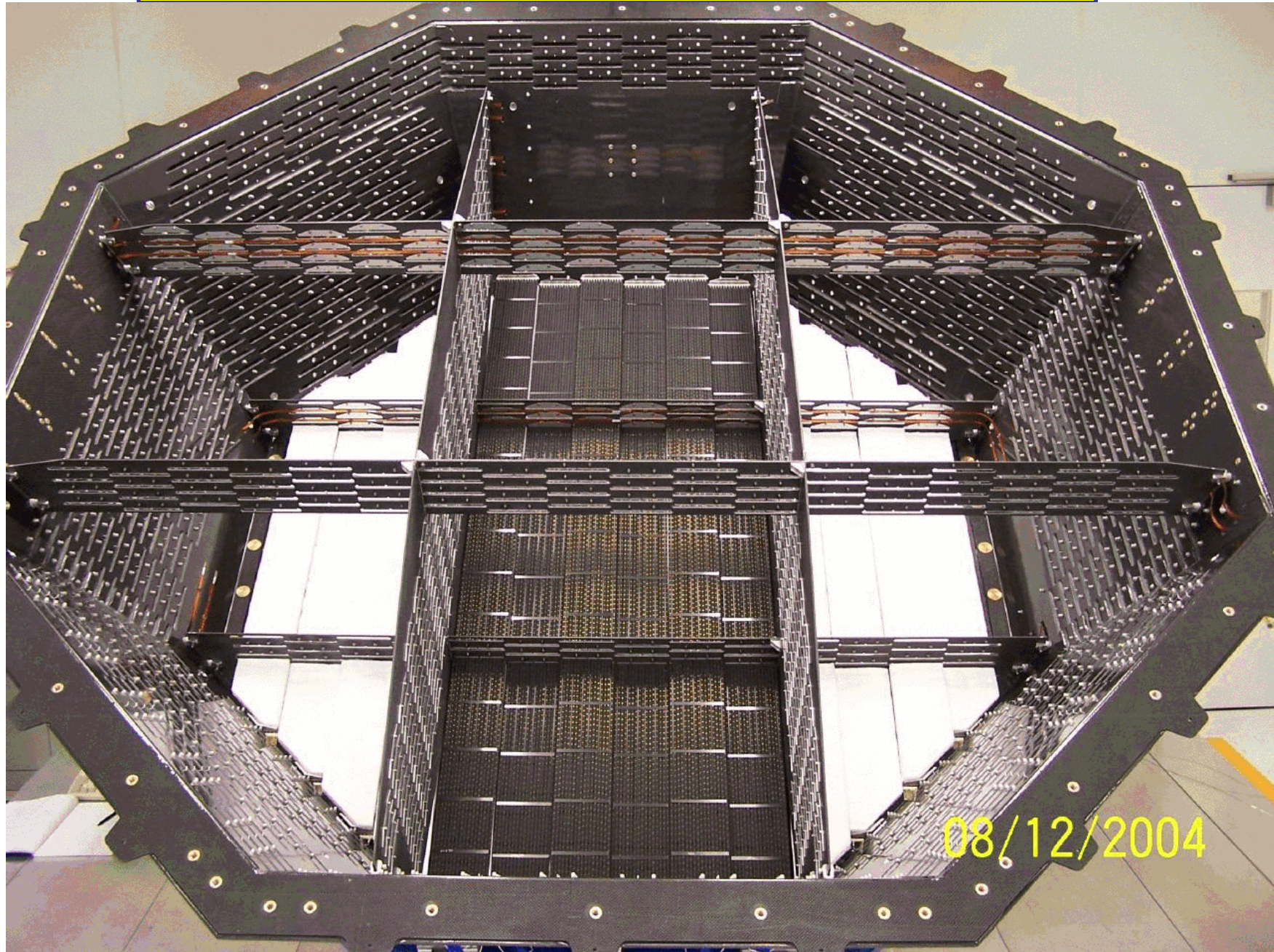
TRD: Flight Modules Gasgain Homogeneity



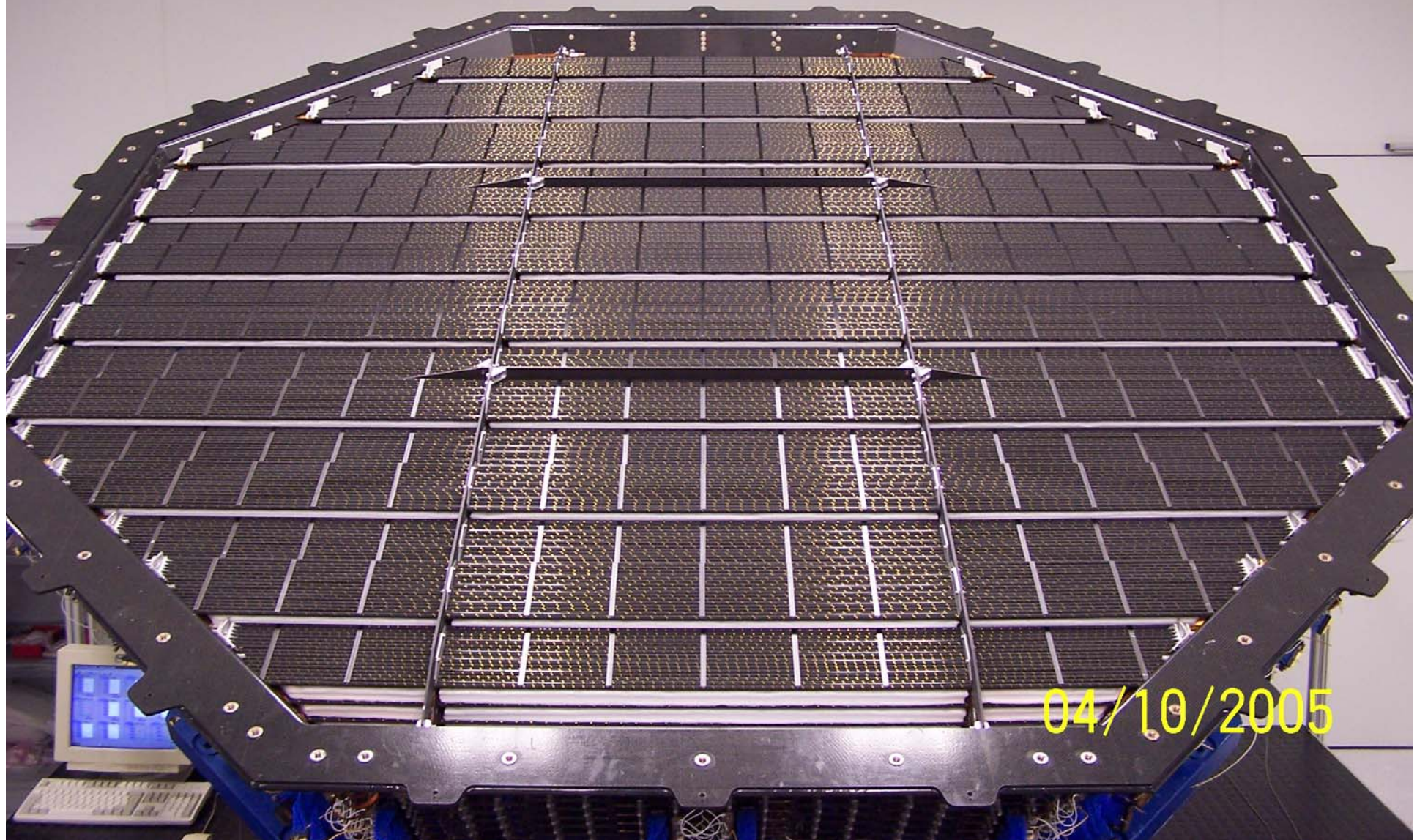
AMS-TRD 07/10/2005

$$\text{Grms}_{\text{OCT}}^2 = \text{Grms}_{\text{GRT}}^2 + \text{Grms}_{\text{SHM}}^2$$

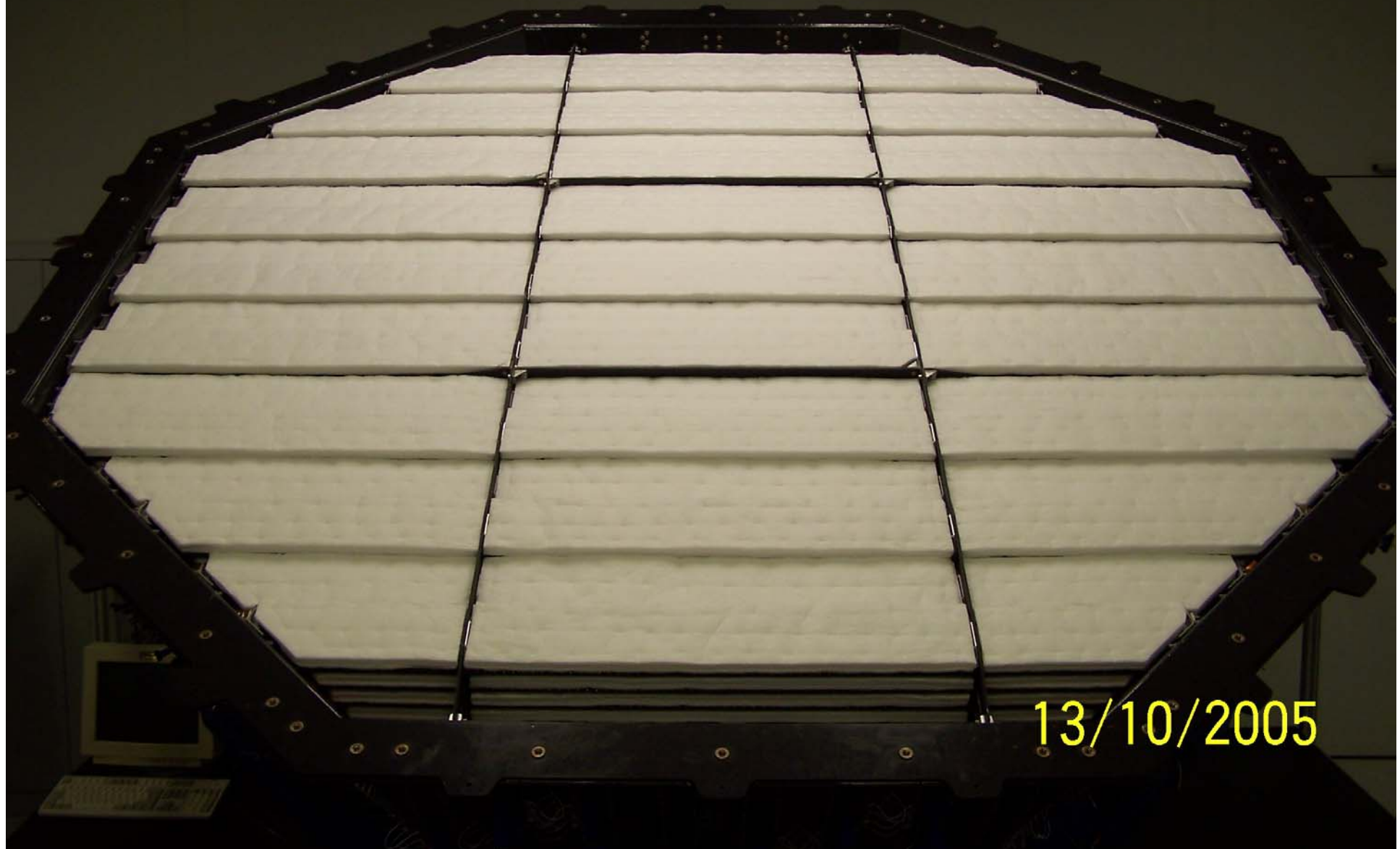
TRD: Flight Module Integration Status



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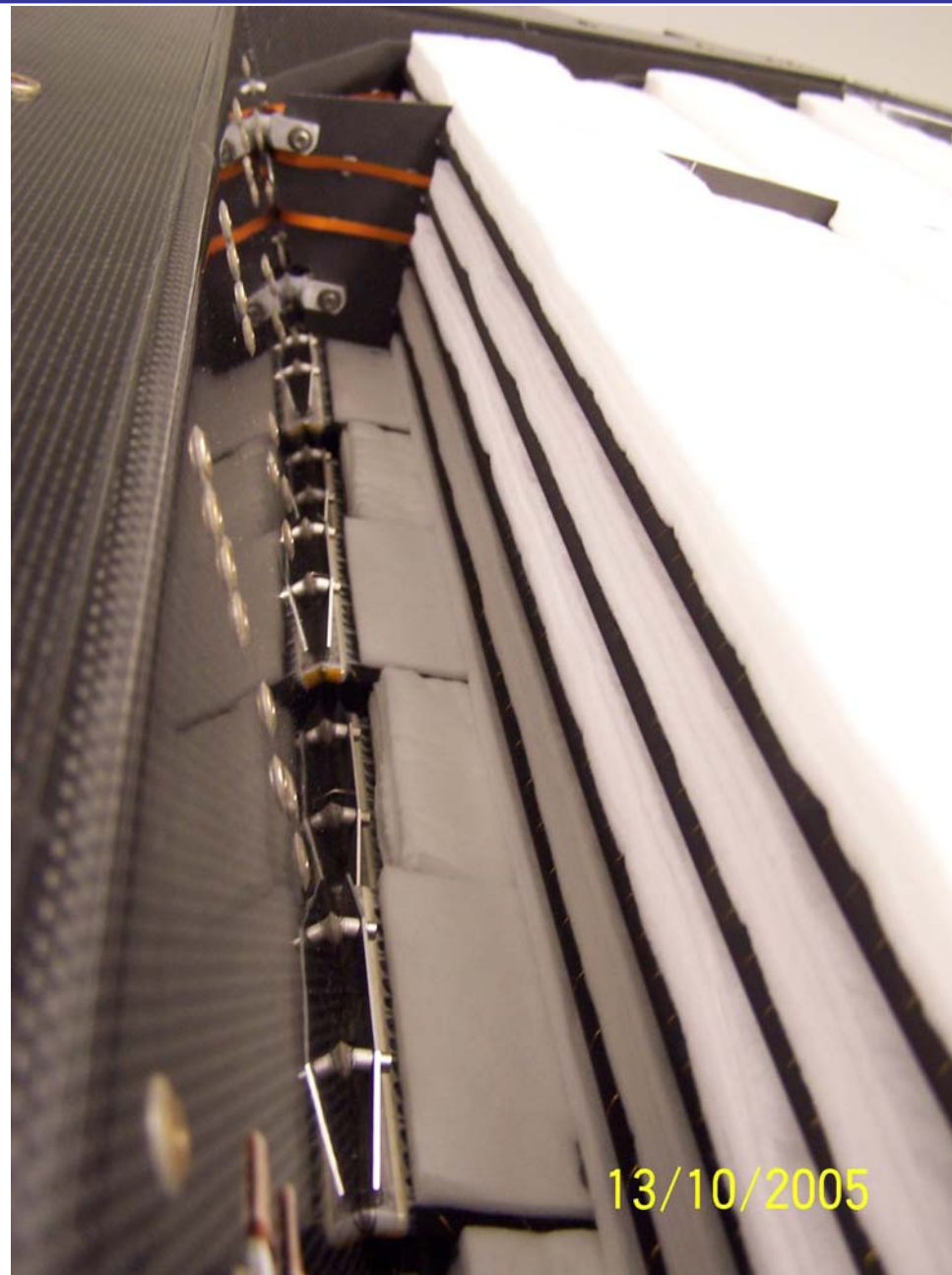
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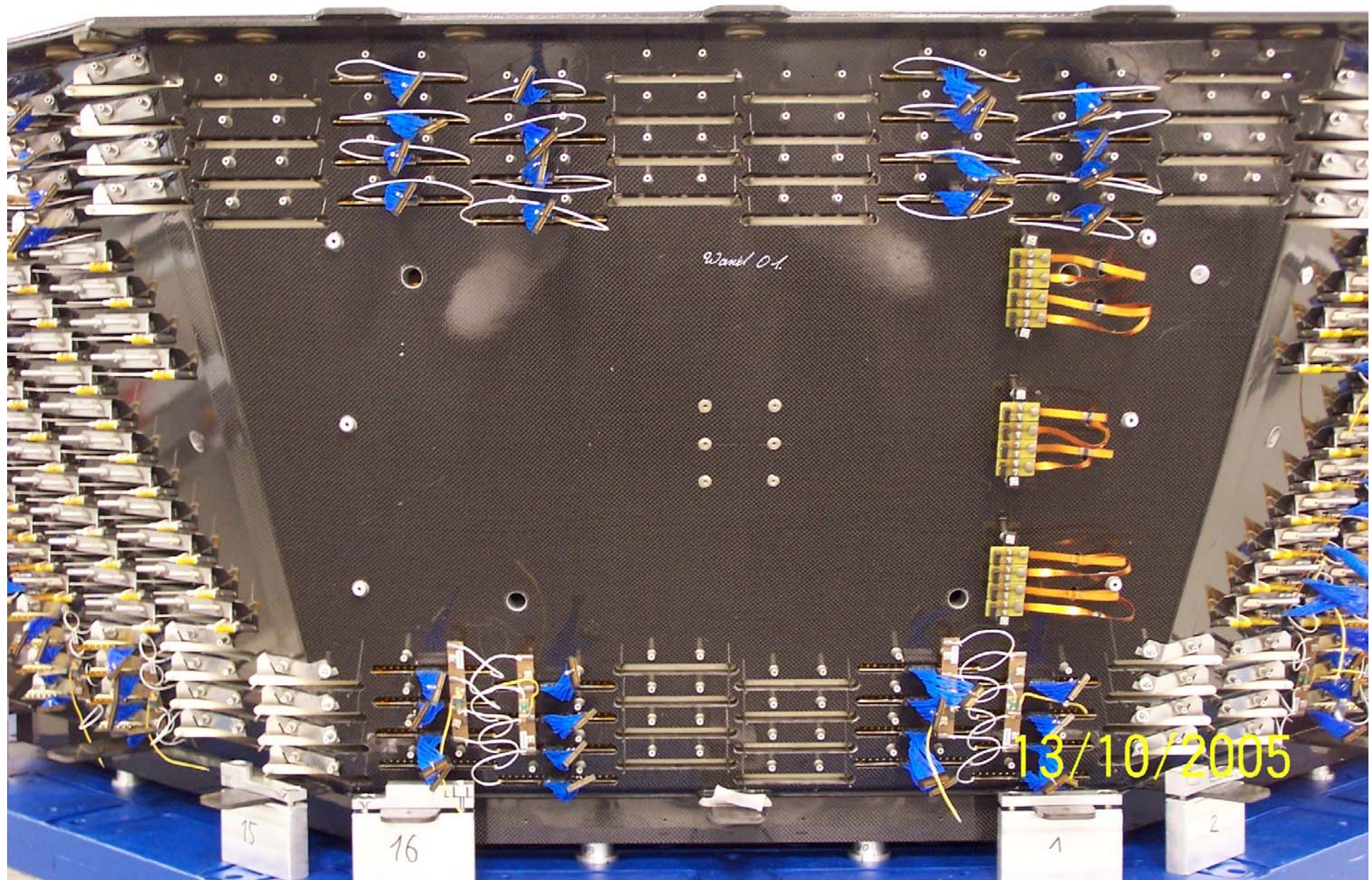
13/10/2005

TRD: Flight Module Integration Status

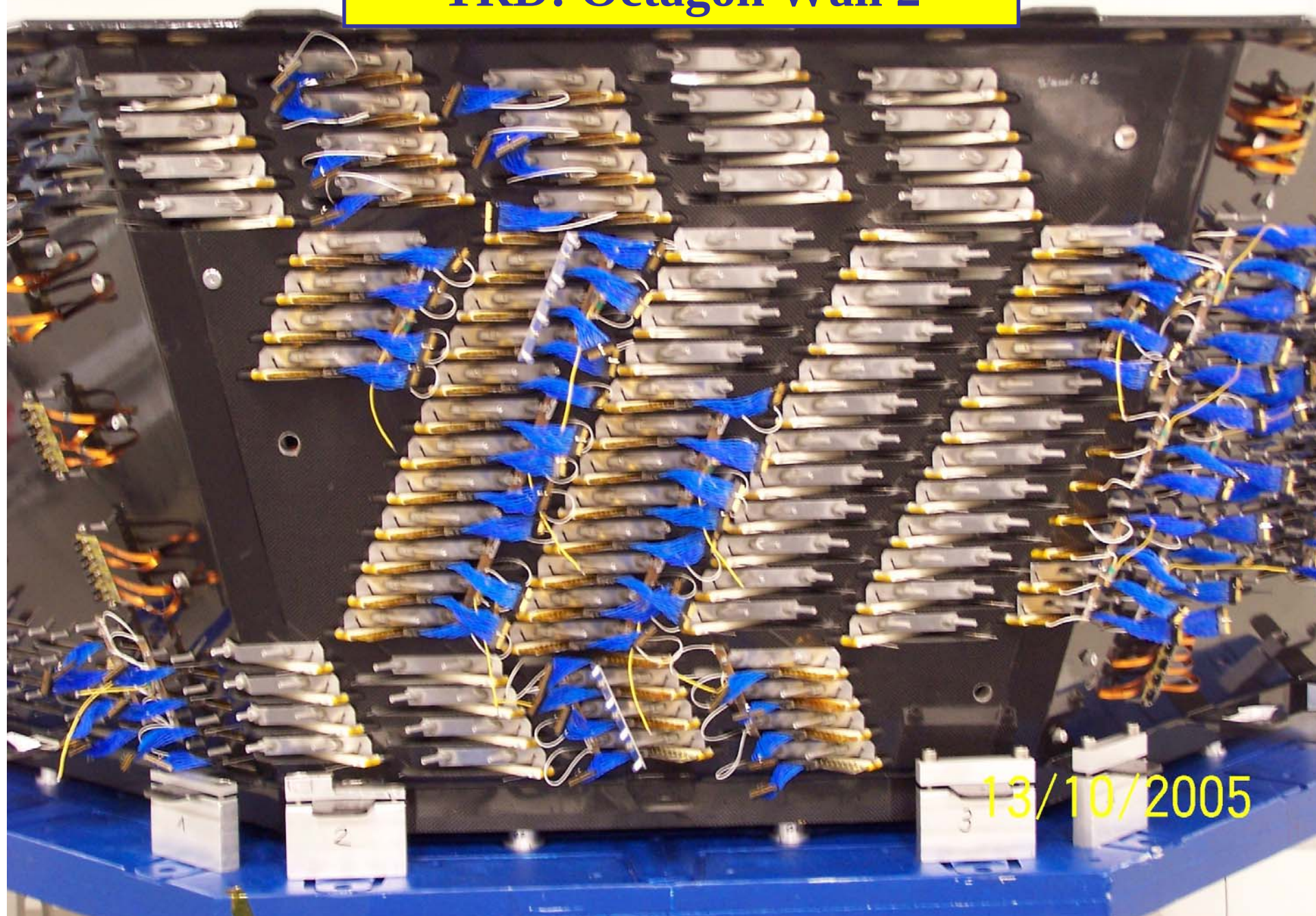


13/10/2005

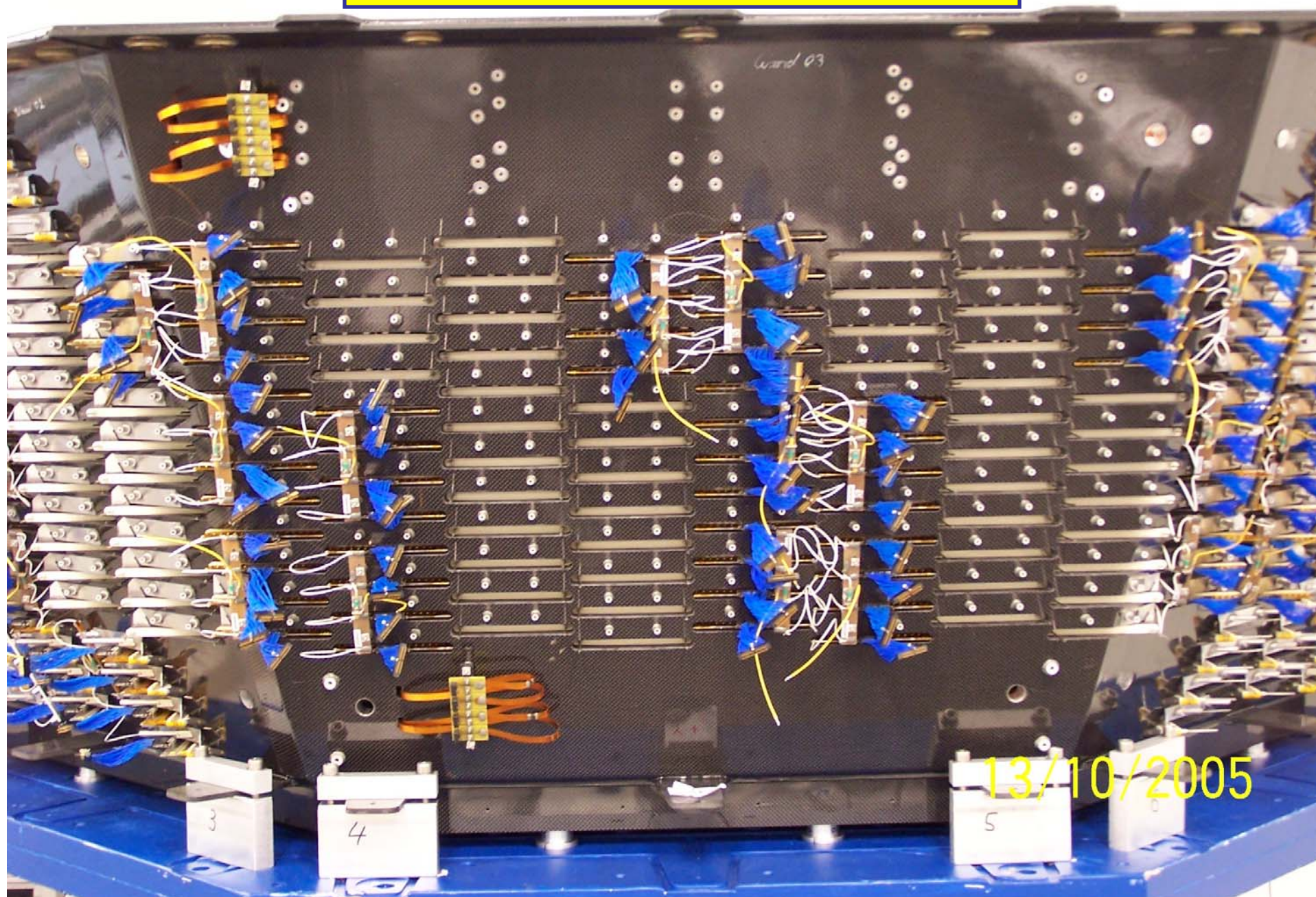
TRD: Octagon Wall 1



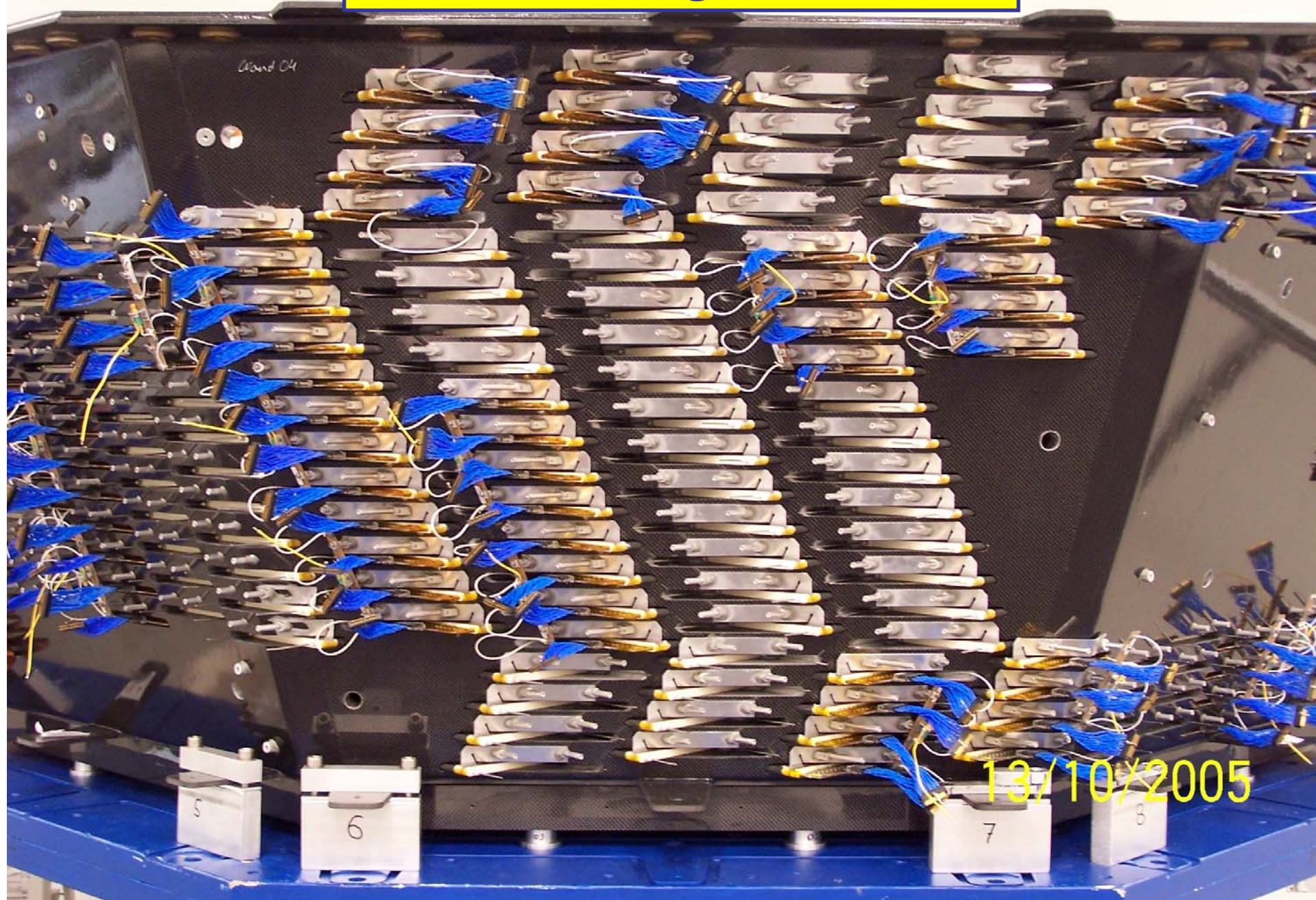
TRD: Octagon Wall 2



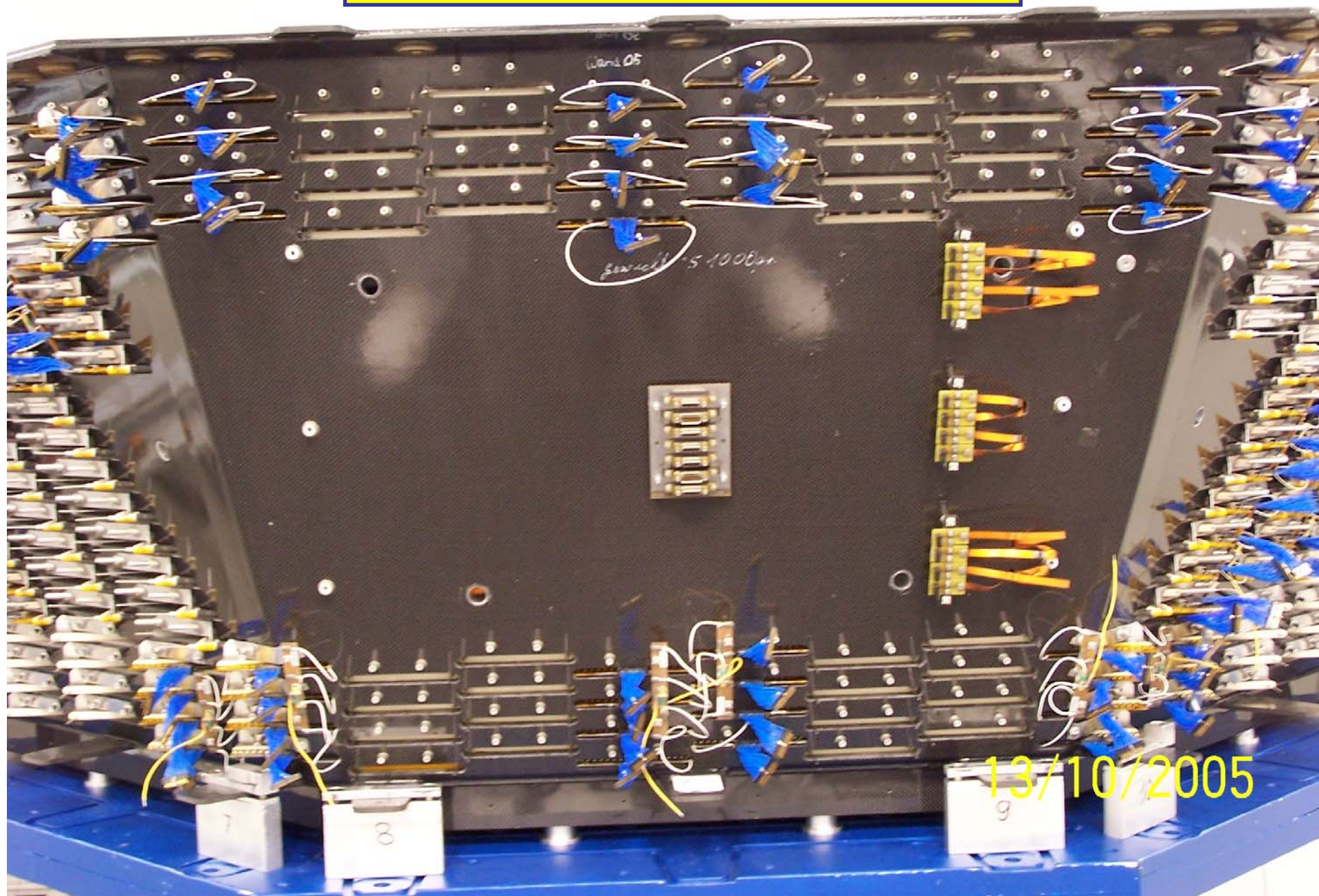
TRD: Octagon Wall 3



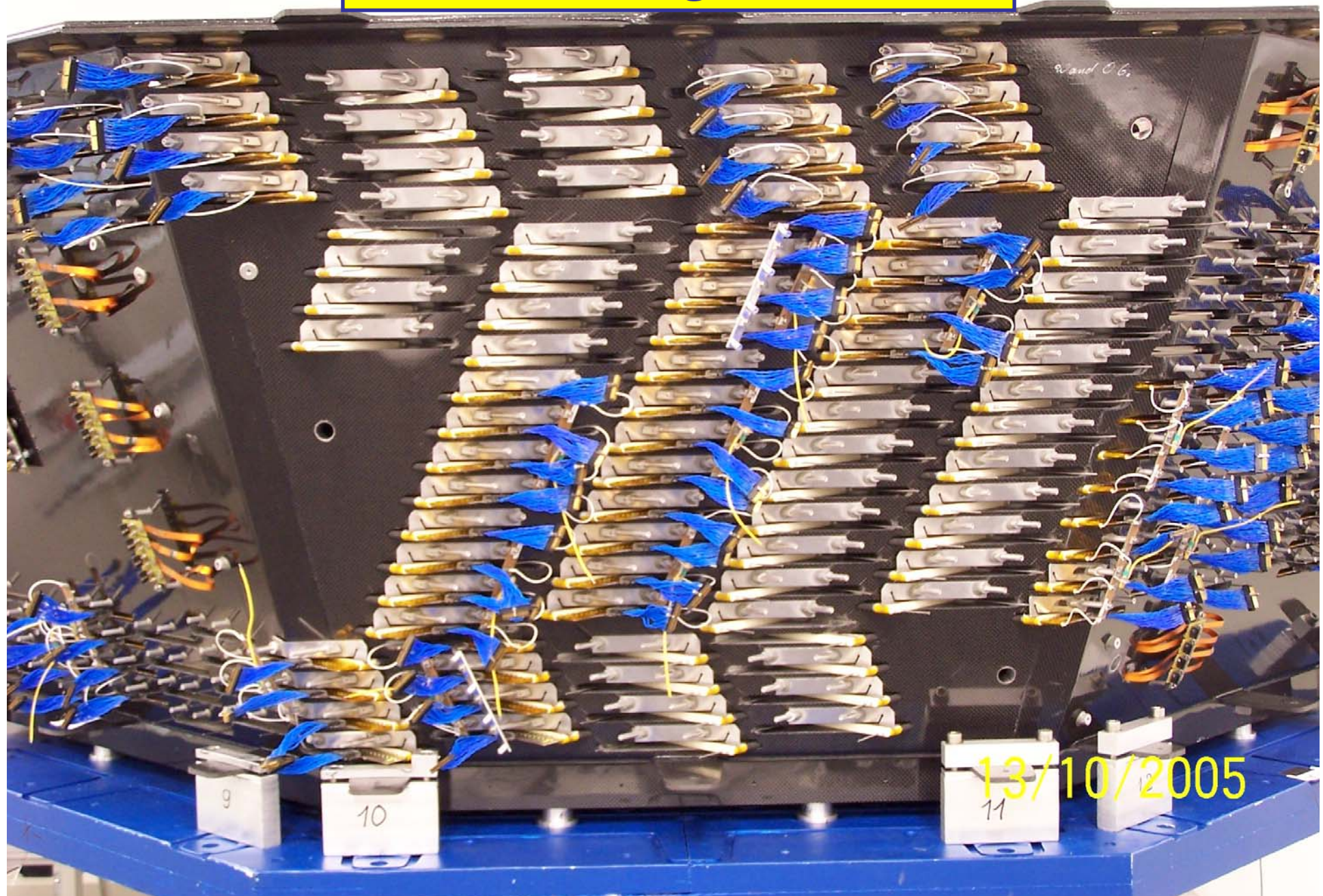
TRD: Octagon Wall 4



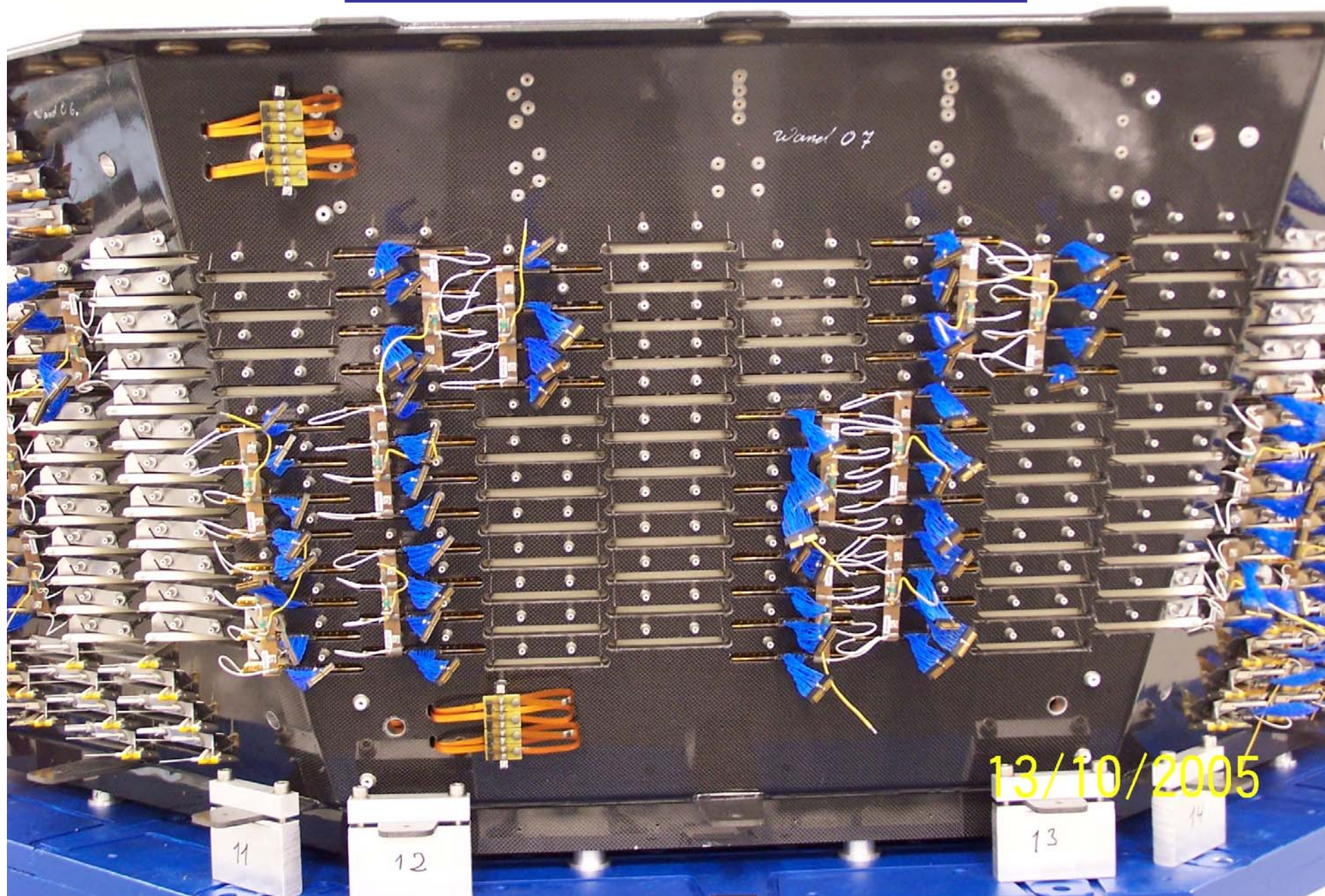
TRD: Octagon Wall 5



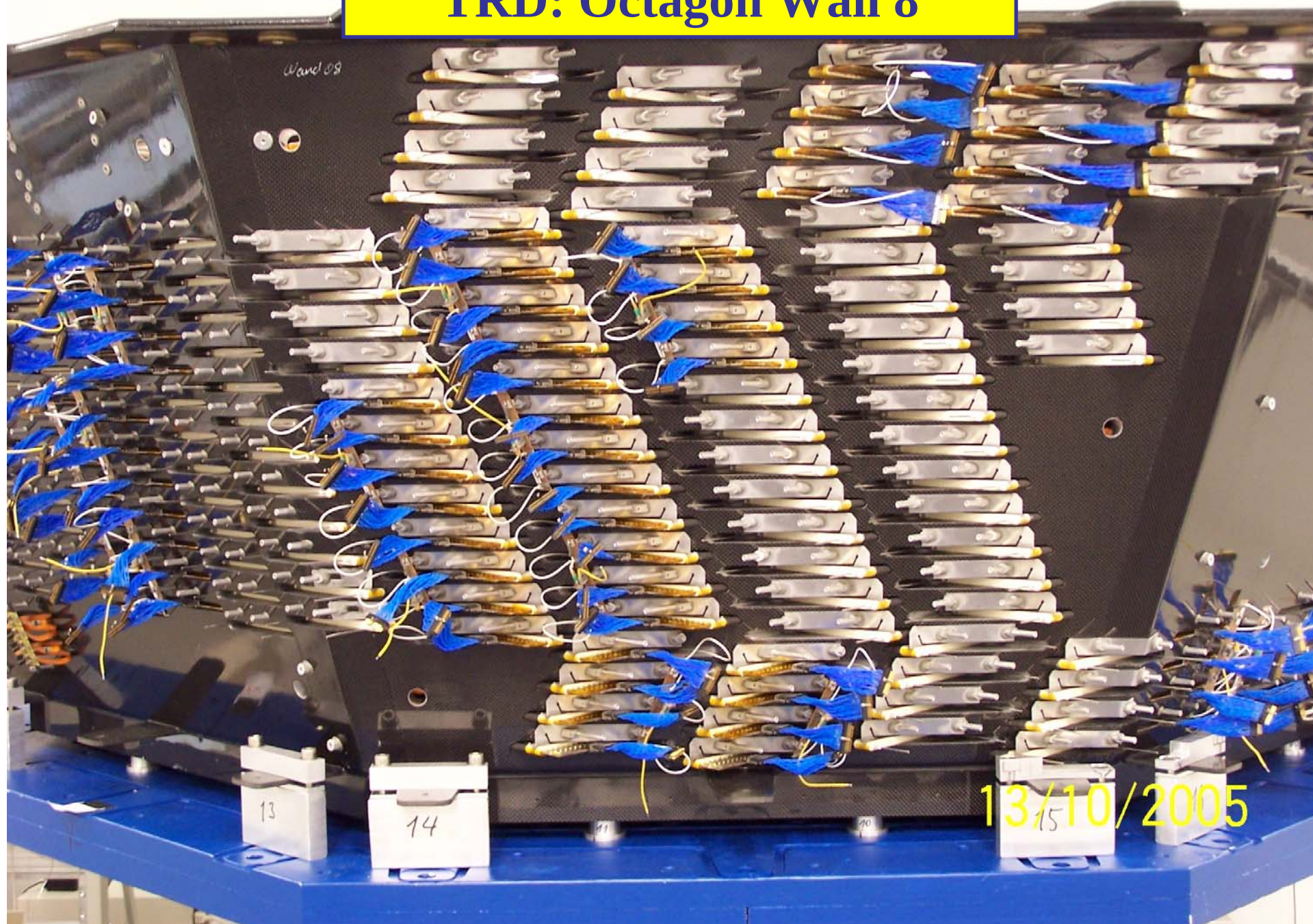
TRD: Octagon Wall 6



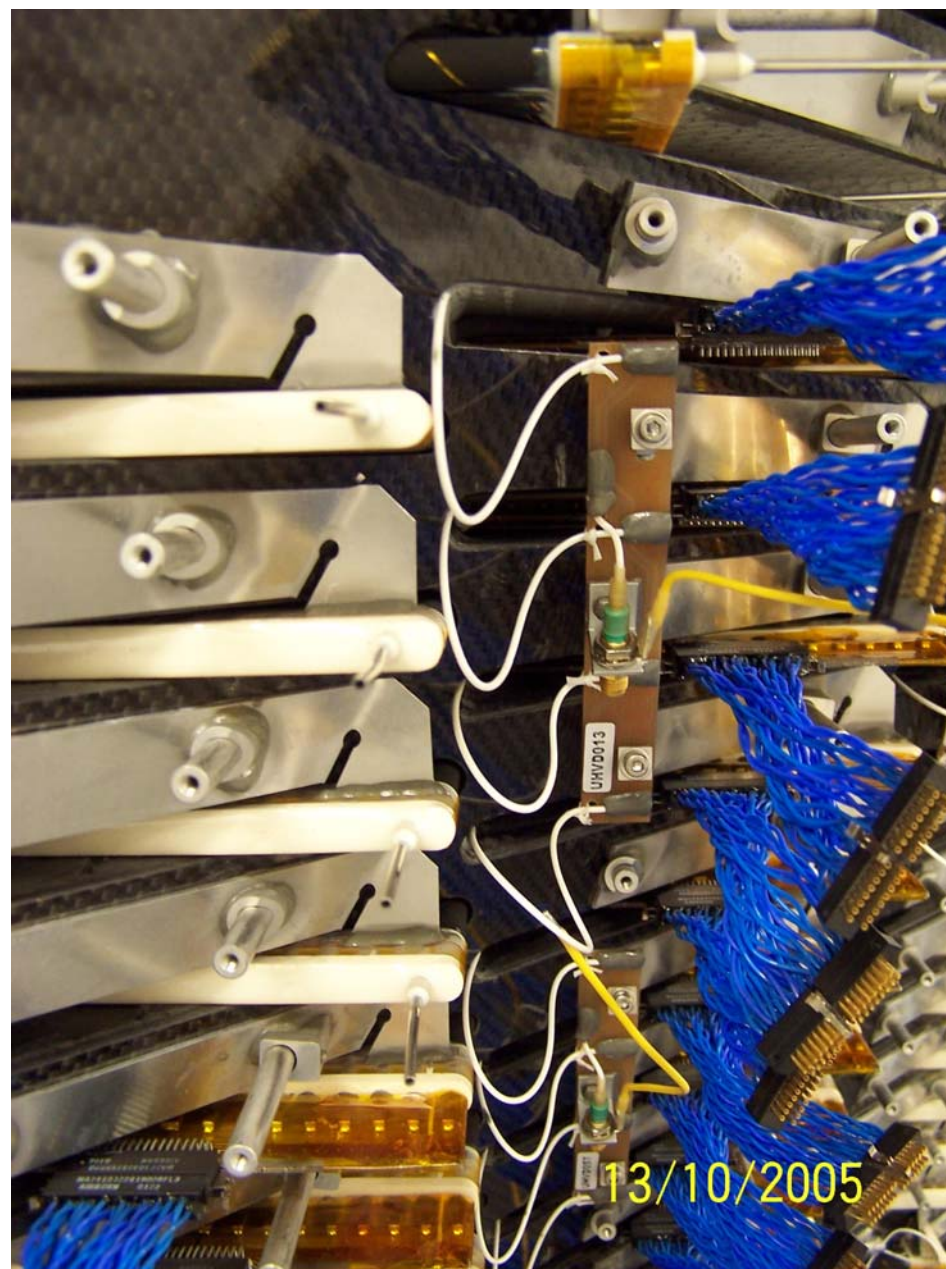
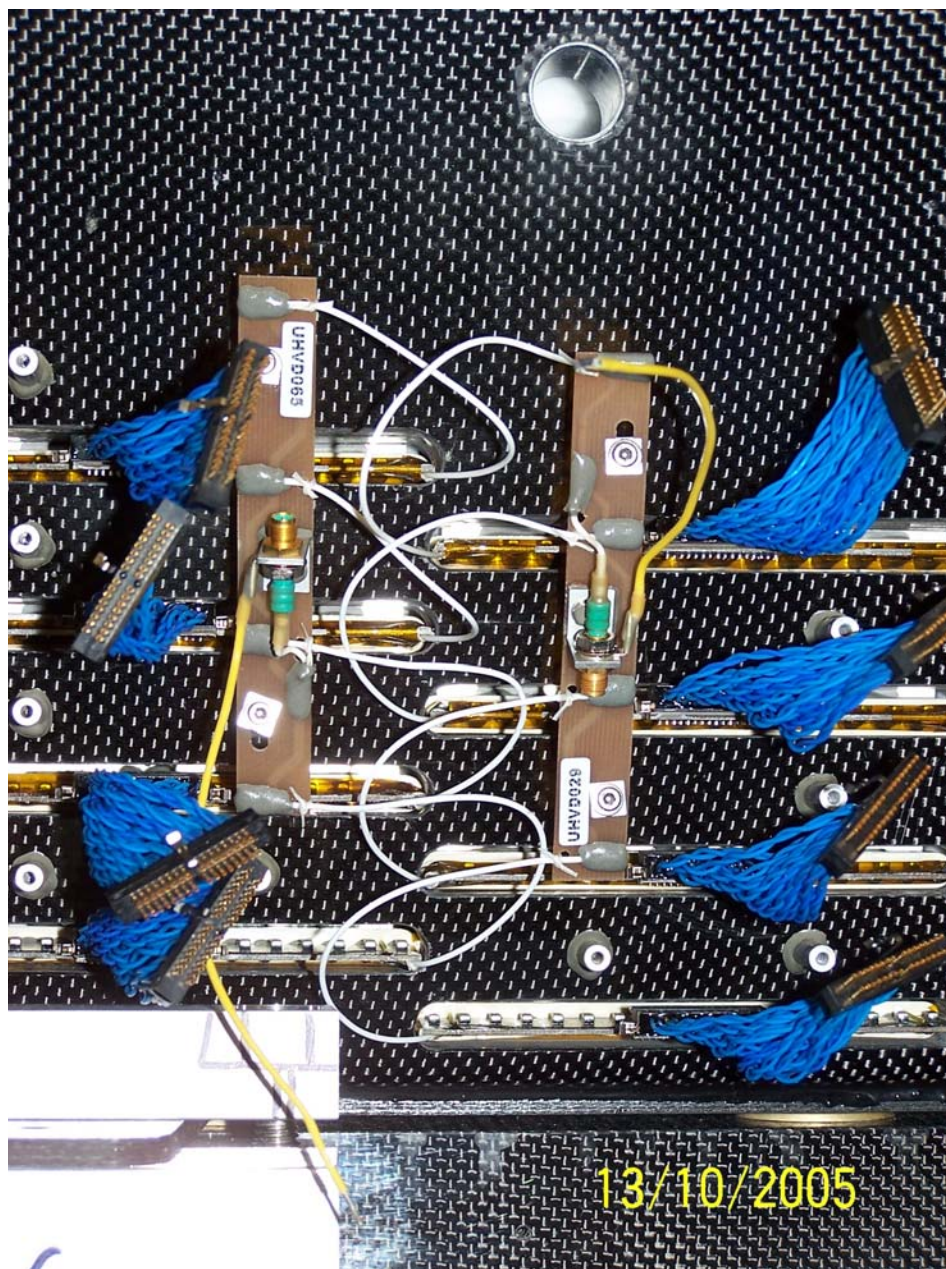
TRD: Octagon Wall 7



TRD: Octagon Wall 8



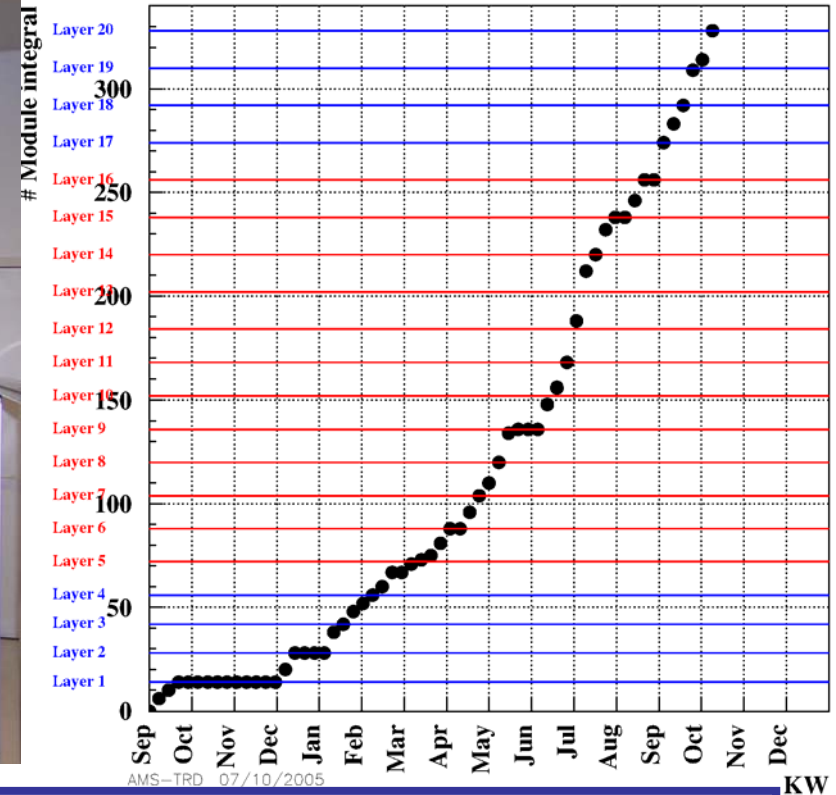
TRD: Integration Status



TRD: Flight Module Integration Status



Module-Octagon-Integration 04/05



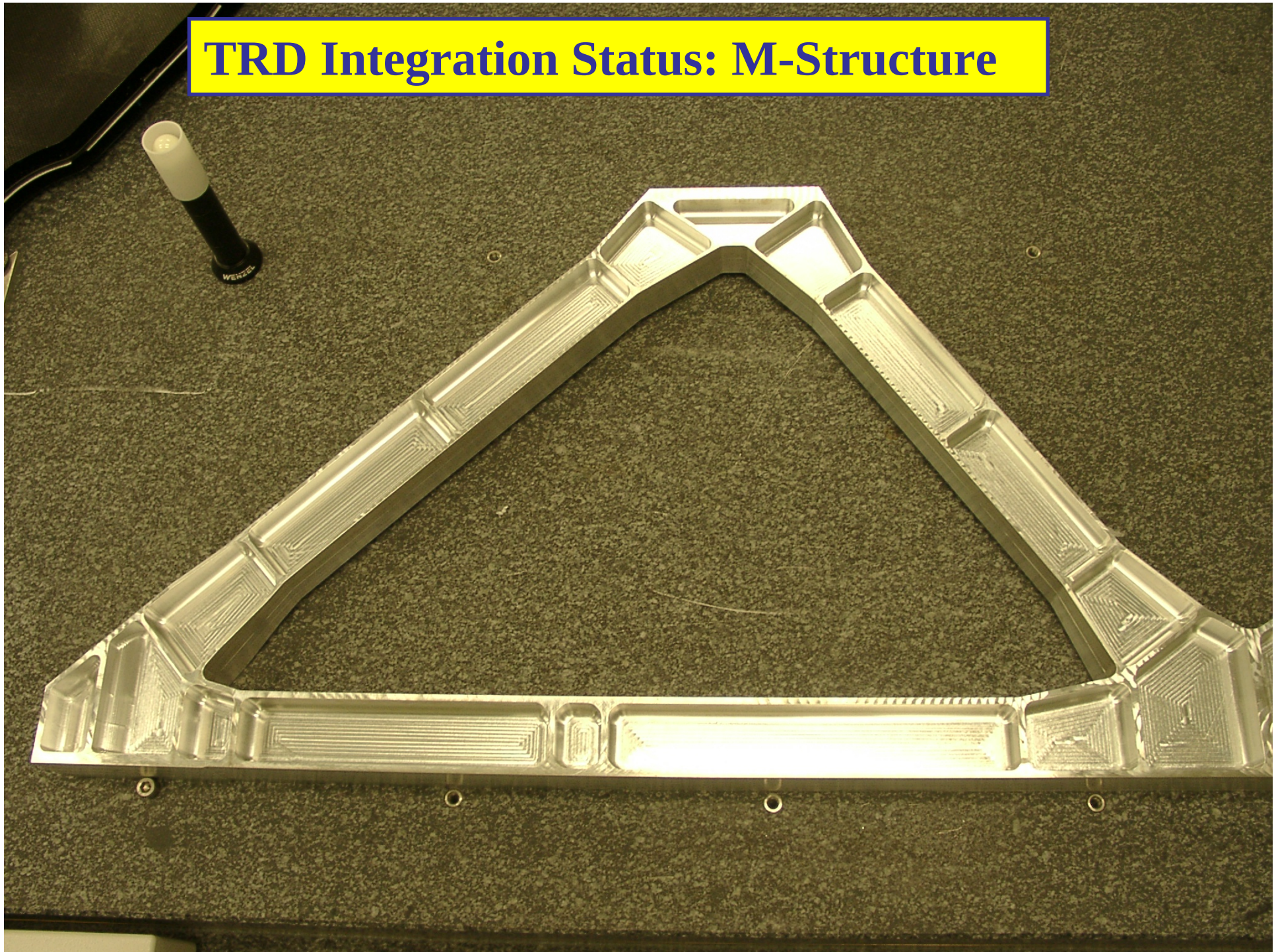
- Module Integration
- Dallas Sensors
- UHVD Mounting
- Gas Interconnection Tubes
- UFE-Board Mounting

Layer 1-16, finished Nov. 05
 finished Jan. 06
 finished March 06

TRD Integration Status: M-Structure



TRD Integration Status: M-Structure



TRD Integration Status: M-Structure

