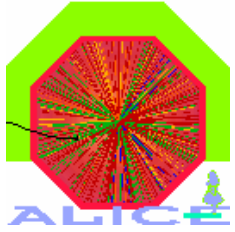


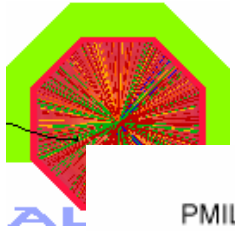
Radiation Monitoring in Alice Experimental Area

1. Active monitoring, in the $\mu\text{Sv/h}$ range, for personnel protection purpose.
2. Beam abort system (by 'fast' monitors)
- 2'. 'Luminometers' see Tapan's presentation
3. Active monitoring, in the mGy/h range, for components survey.
4. Passive dosimetry, in the (multi-)Gy/y, also for components survey.

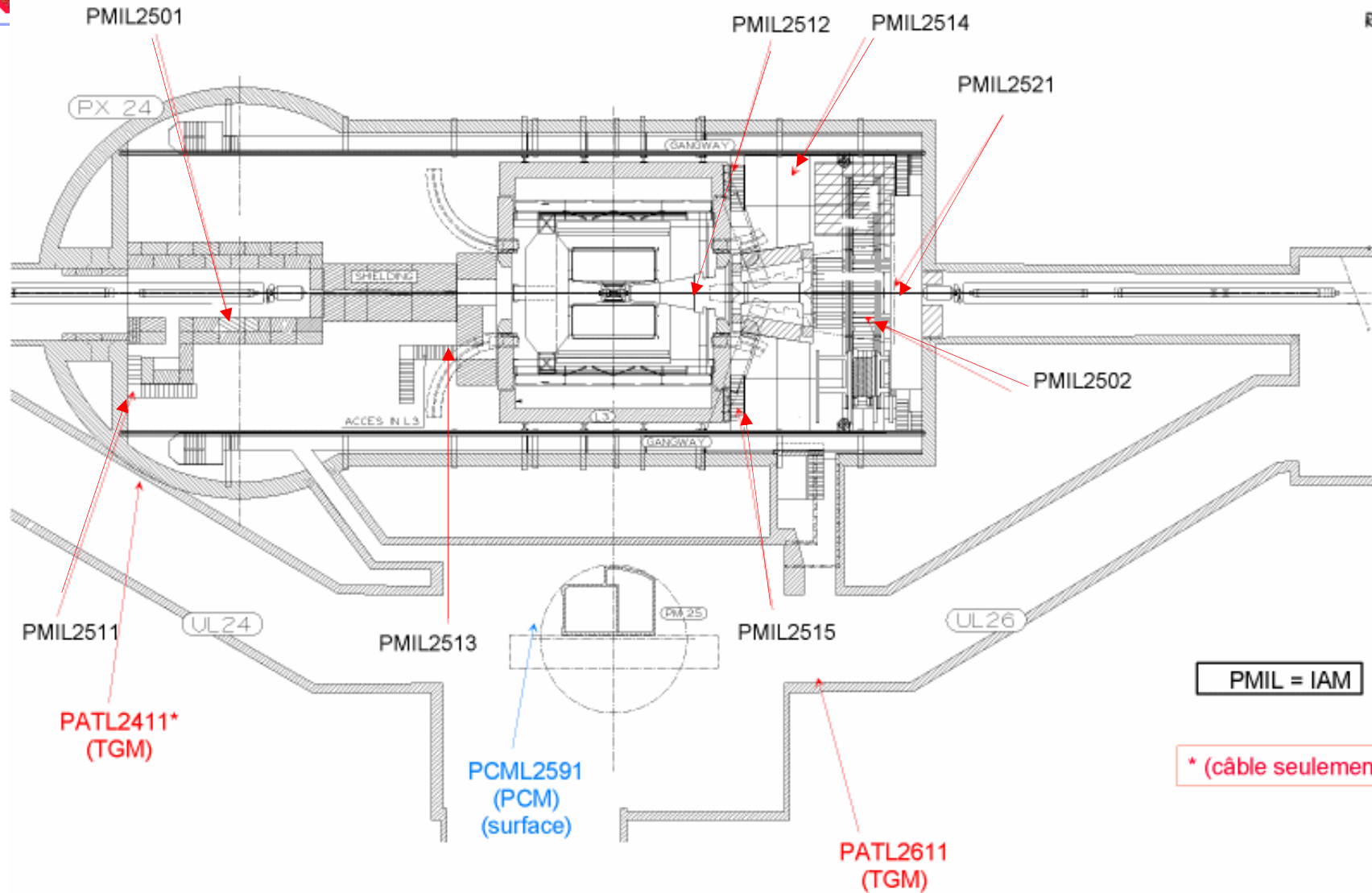


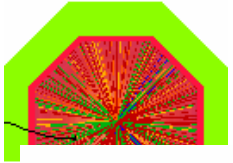
1. Active monitoring, for personnel protection purpose

- Measured the induced activity (γ rays) in the $\mu\text{Sv/h}$ range
- By ionizing chambers (8 liters),
- **Only 'active' when beam is off**
 - Saturated when beam is on
- Part of the **RAMSES** project, by SC-RP, SC-TS, TS-CSE
- Data transmitted to DCS via RAMSES
- Location and cabling are determined - **OK**

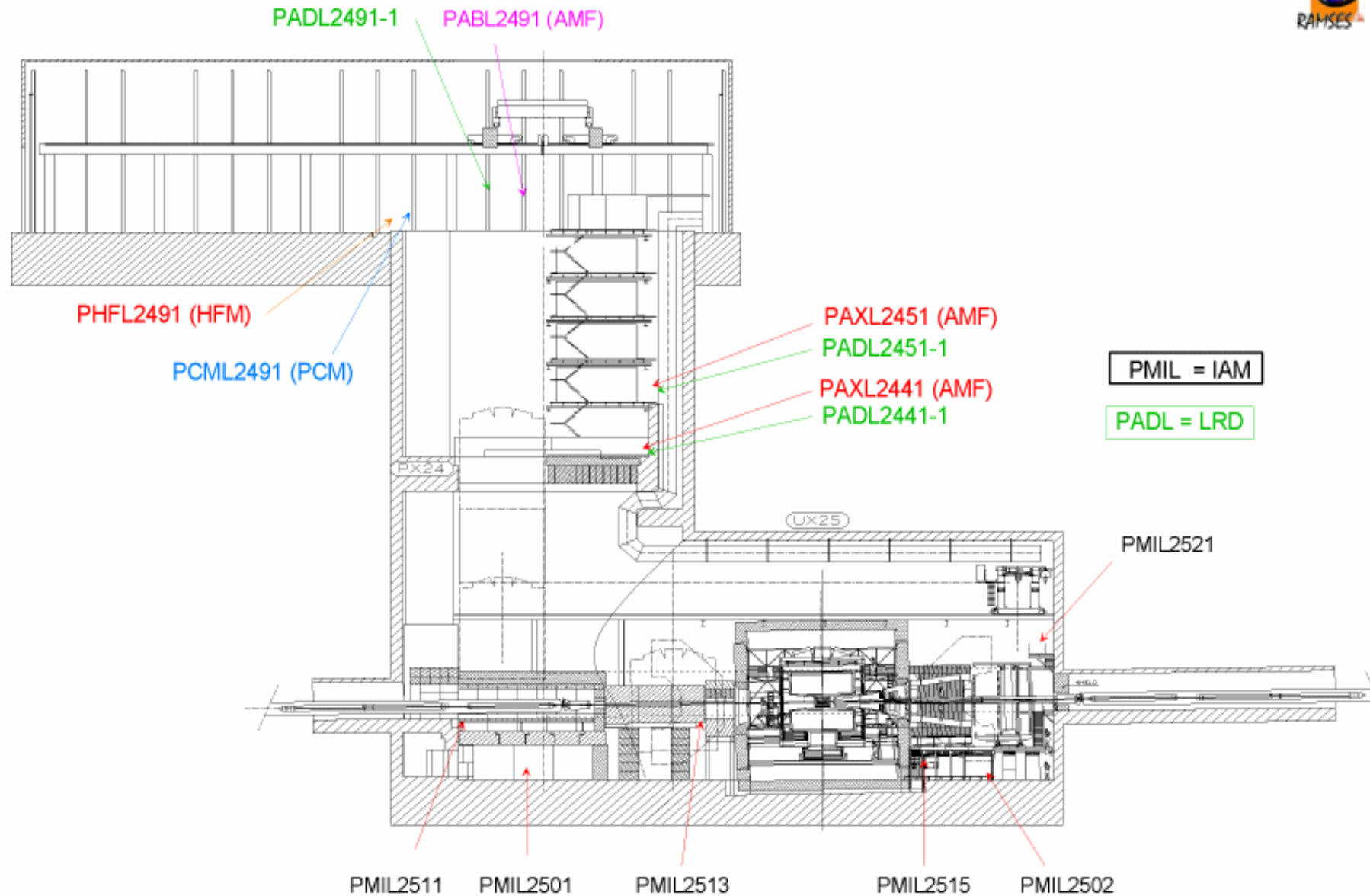


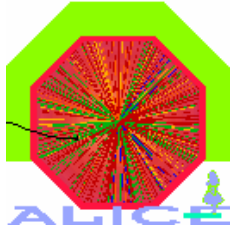
1. Location of RAMSES active monitors





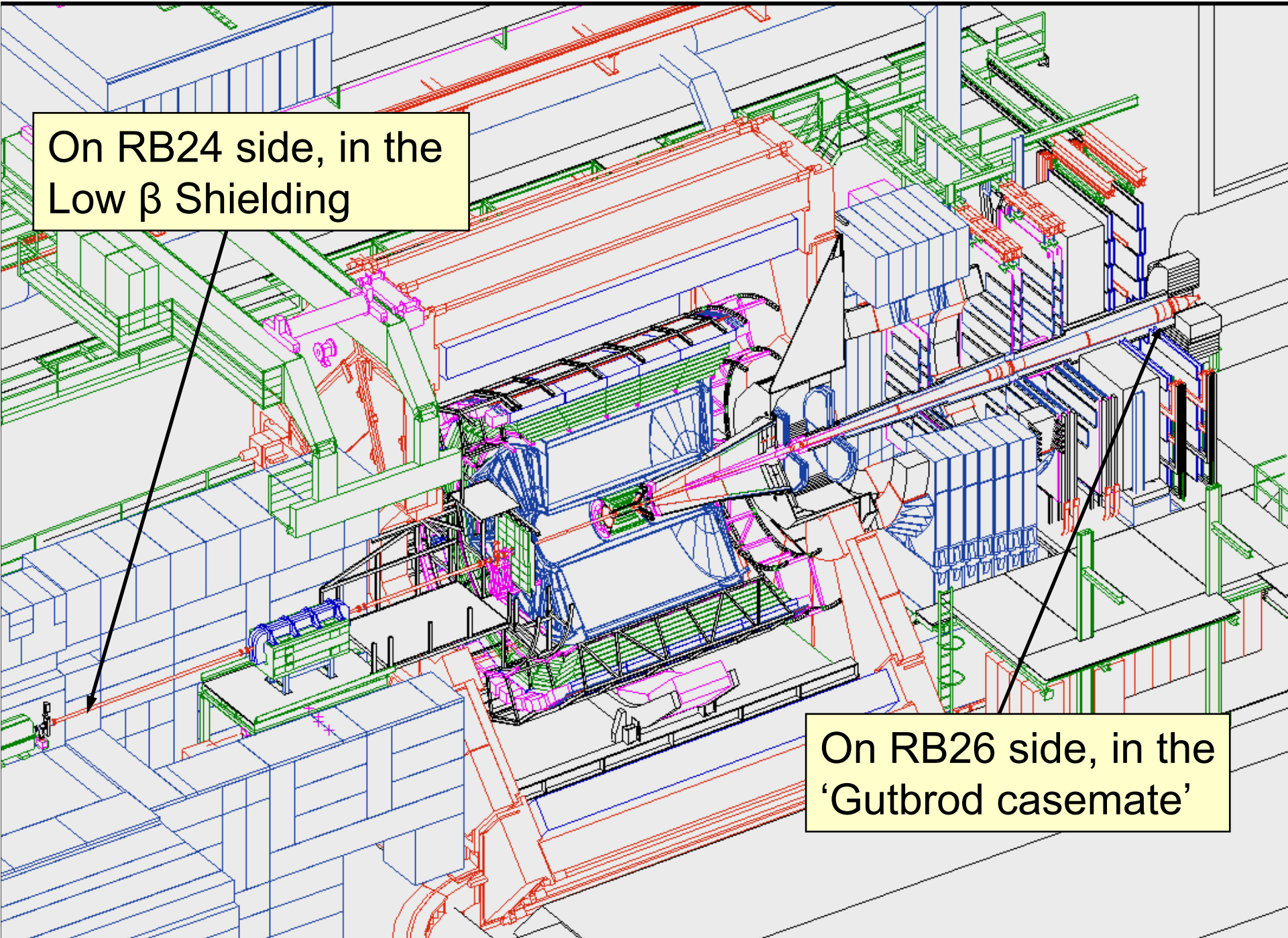
1. Location of RAMSES active monitors





2. Beam-Condition Monitoring, to trigger a beam-abort signal

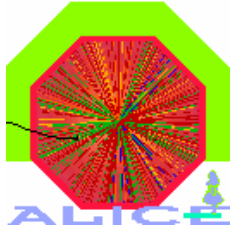
- Based on 1 cm² diamond sensors (by *Element-6*, + metallization, ~ 1 kCHF each)
- 4 sensors on A & C sides (see location next slide)
- Read-out by ELMB cards
- Electronics under **development by LHCb** + Uni-Dortmund (contact = Ch. Ilgner)
- Price, availability, cables ???
- Signal sent to DCS + 'machine'.



On RB24 side, in the
Low β Shielding

The image is a detailed 3D CAD model of a nuclear reactor's internal structure. It features a complex arrangement of components, including a central cylindrical vessel, various support structures, and piping. The model is rendered with a multi-color wireframe style, where different parts are highlighted in blue, green, red, and purple. Two callout boxes with black arrows point to specific areas: one on the left side of the central vessel and another on the right side, pointing towards a large rectangular structure.

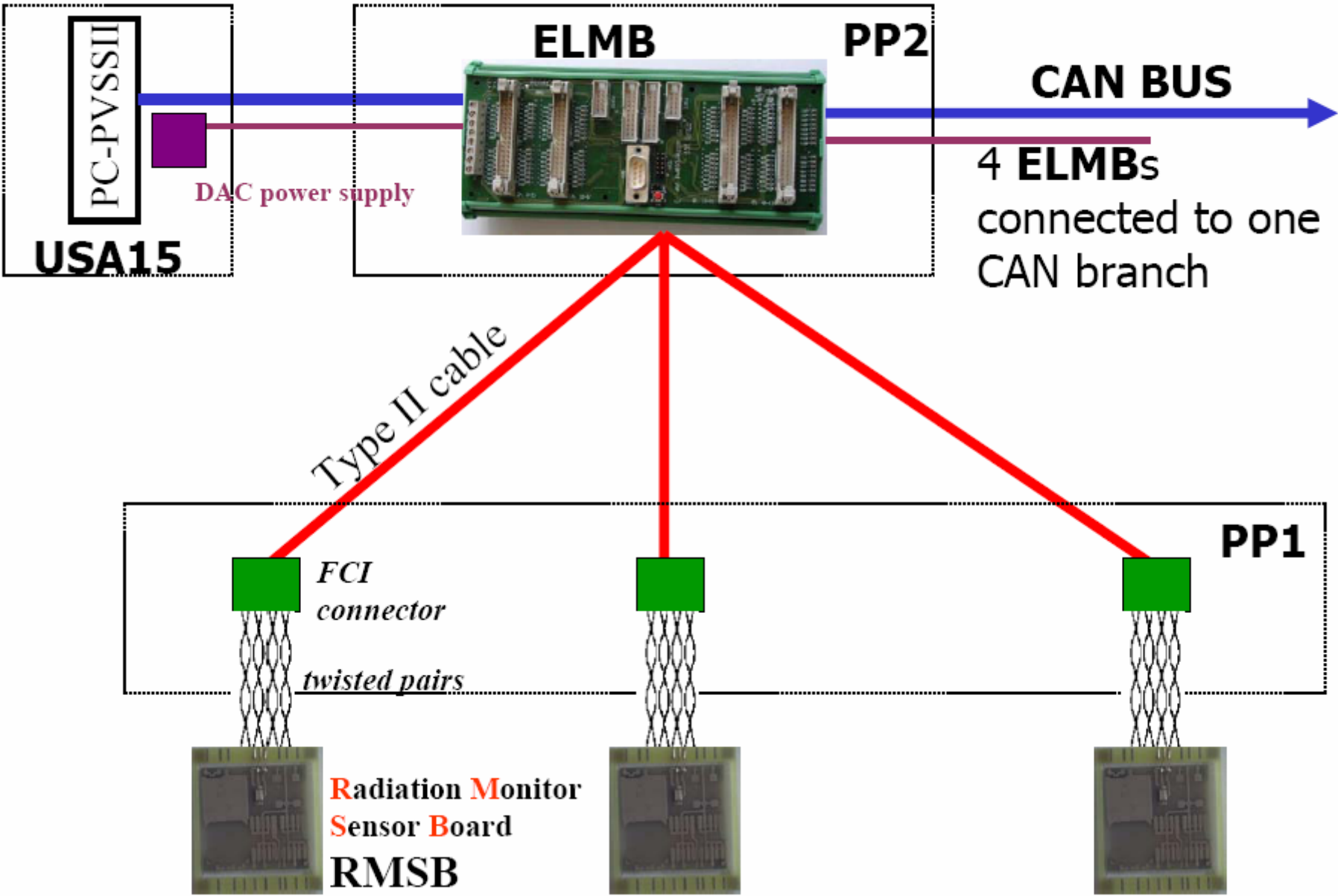
On RB26 side, in the
'Gutbrod casemate'

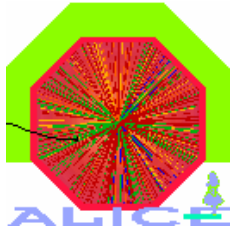


3. Active monitoring, in the mGy/h range, for components survey

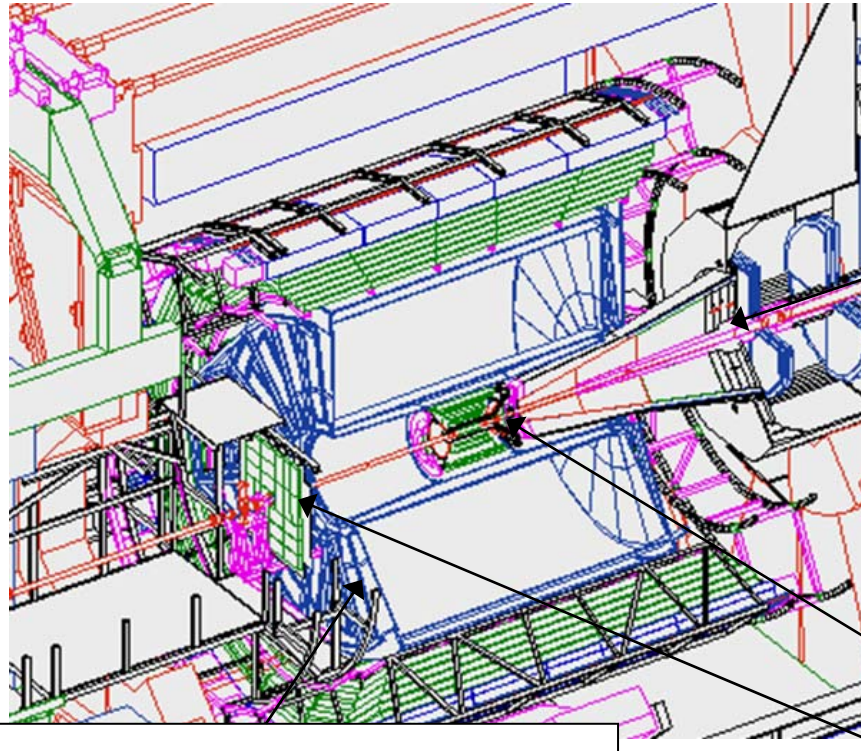
- Sensors selected and calibrated by PH-DT2 (RadMon project) = Rad-Fets + PIN diodes
- Boards + Electronics developed by ATLAS (~ 500 CHF/board equipped with sensors)
- 10 sensors + location, see next slides
- Signal to be treated by DCS
- + some work to be done by our DCS team.

Schematic view of the on-line monitor





Calculated yearly doses and fluences + locations of 7 sensors

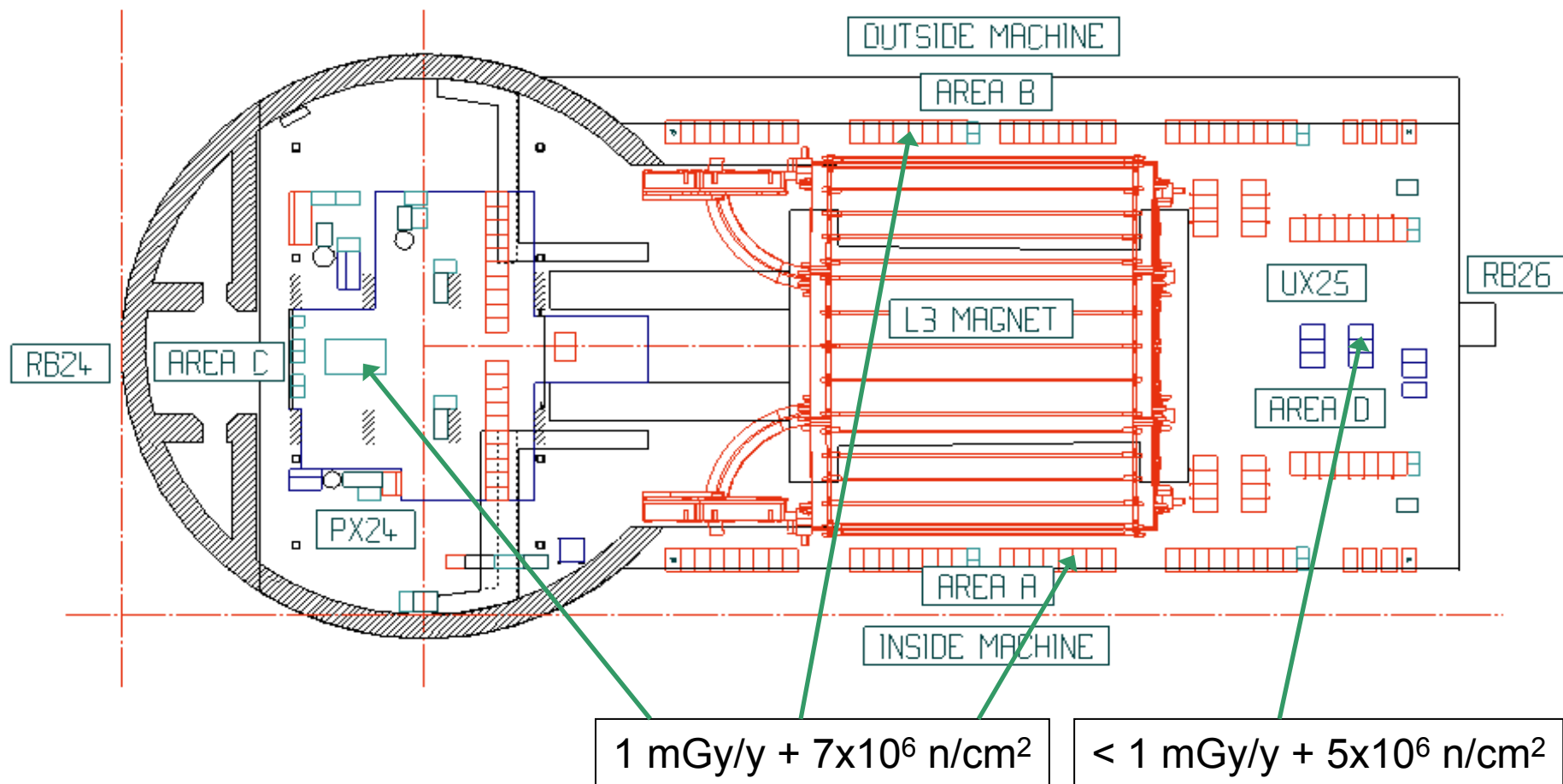


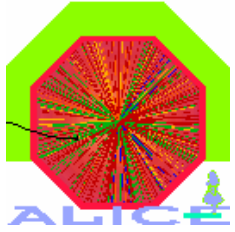
First muon chamber
1 Gy/y + 5×10^{10} h/cm²
1 sensor on FA's end

TPC outer radius and outer detectors
~ 0.1 Gy/y + 2×10^{10} h/cm²
2 sensors on each side of Space-Frame:
1 on inner ring, 1 on outer ring

TPC inner radius, ~1 Gy/y
+ 4×10^{10} h/cm²
1 sensor on FA nose
1 sensor on RB24 V0 support

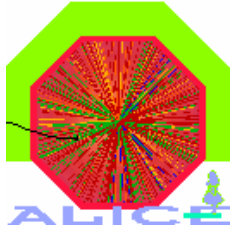
Electronic racks, yearly calculated doses + locations of 4 sensors





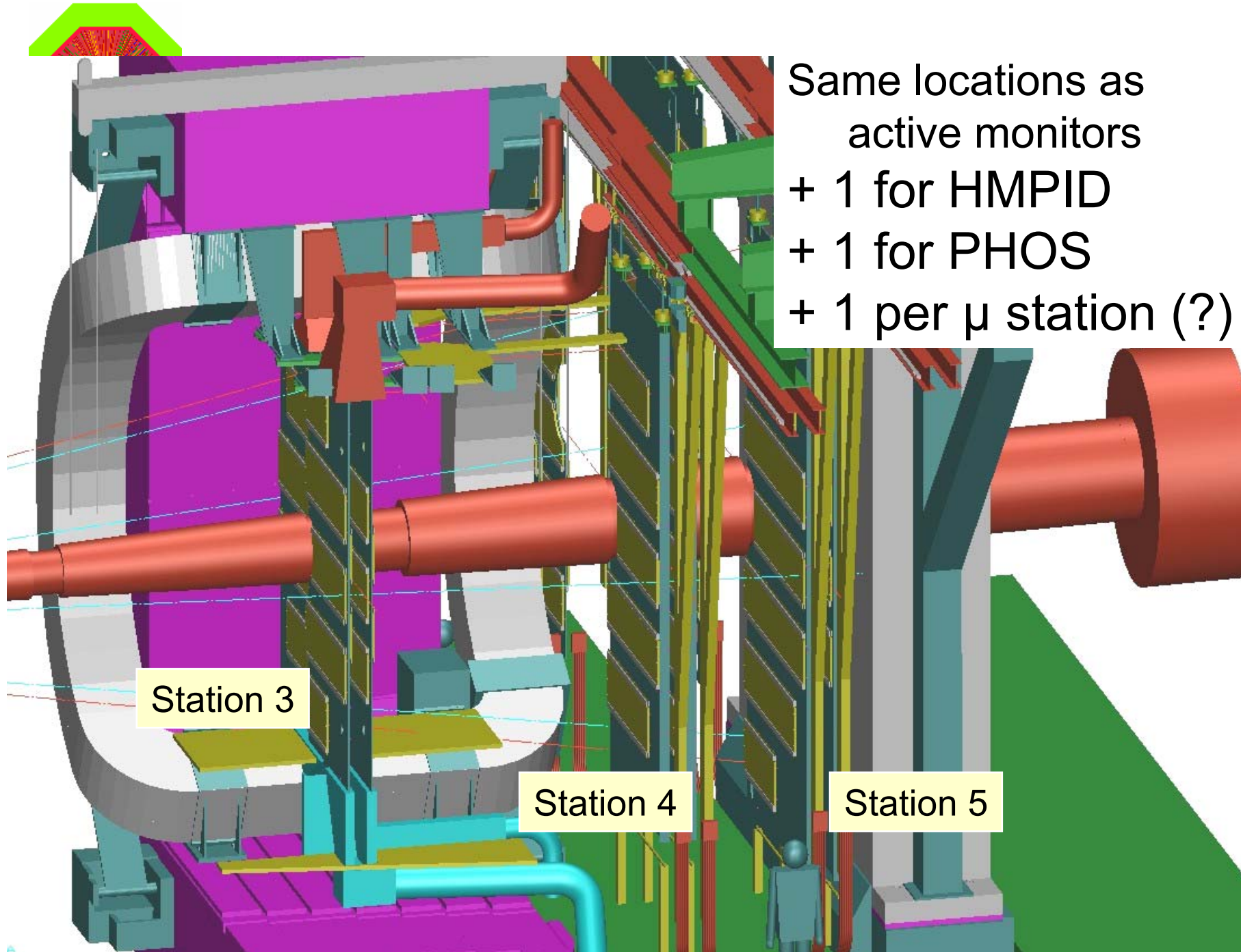
3. Summary for active monitors :

Place	dose/y	flux/y	No
SPD1	200	3×10^{11}	0
SDD2	26	2×10^{10}	0
TPC	10	1×10^{10}	2
TRD+TOF	0.1	3×10^9	4
HMPID+PHOS	0.05	2×10^9	0
μ electr.	0.5	6×10^{10}	1
Racks	0.001	7×10^6	4



4. Passive dosimetry, in the (multi-) Gy/y range, for components survey

- Dosimeters selected and calibrated by SC-RP
- Reading by outside contract (Cost ? To be shared.)
- 22 dosimeters (~ 10 CHF each)
- Location → same as active monitors
+ further proposal (?)
- To be exchanged and read every year.

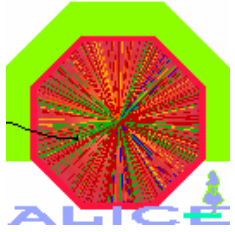


Same locations as active monitors
+ 1 for HMPID
+ 1 for PHOS
+ 1 per μ station (?)

Station 3

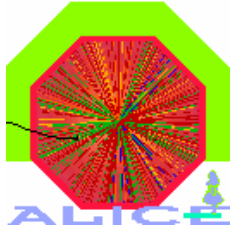
Station 4

Station 5



4. Summary for passive dosimeters :

Place	Y.dose	Y.fluence	Type	No
SPD1	200	3×10^{11}	RPL	0
SDD2	26	2×10^{10}	RPL	0
TPC	10	1×10^{10}	TLD	2
TRD+TOF	0.1	3×10^9	TLD	4
HMPID+PHOS	0.05	2×10^9	TLD	2
μ electr.	0.5	6×10^{10}	TLD	10
Racks	0.001	7×10^6	TLD	4



3+4. Constrains for dosimetry:

In general for active monitor:

Routing of cables to be defined !

Magnetic field is not a concern any longer.

ITS

Very little space, accessibility

FEE in L3

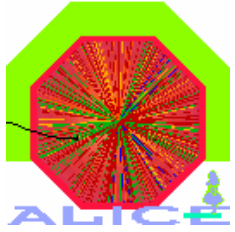
Restricted access ~ok

μ electr.

Confined space, but ~ok

Racks

Easy access



Conclusions

1. RAMSES - Ok
2. Beam abort system
 - Development ongoing by LHCb
 - Alice will “buy” their system.
3. Active monitoring
 - Routing of cables + installation
 - Some development to be done by our DCS
4. Passive dosimeters - Ok