



DArT in ArDM : status

On behalf of ETHZ ArDM/Darkside group

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Activities of the group (from W.WBS)

- We took Walter's WBS as a starting point
- Proposing some changes as follows:

WBS 1.2 Simulation:

| | Item | Code | Description | Responsible | Additional MPW | Deliverable | status | | | | | |
|-----|------------|------|---|-------------|----------------|---------------|----------------------|-----|-----|-----|-----|-----|
| | | | | | | | | Jan | Feb | Mar | Apr | May |
| 1.1 | TDR | | TDR finalisation | ALL | | TDR completed | | | | | | |
| | | | TDR to LSC Scientific Committee | ALL | | | | | | | | |
| | | | Validation of the technical drawings | ALL | | | | | | | | |
| 1.2 | Simulation | MC | Monte Carlo geometry update | CIEMAT | | | | | | | | |
| | | MC1 | Monte Carlo external bkg studies | CIEMAT | | | DONE? | | | | | |
| | | MC2 | Monte Carlo internal bkg studies | CIEMAT | | | cryostat background? | | | | | |
| | | MC3 | simulation of electronics readout chain | CIEMAT | | | effect of recharge ? | | | | | |
| | | | Simu & LY of ArDM PMT layout | CIEMAT ?? | | | | | | | | |

- *need to understand if our current PMT 5(top) +6(bottom) layout configuration is doing the required job.*

Activities of the group (from W.WBS)

WBS 1.7/1.8/1.9:

| | | | | | | | | | | | | | | | | | | | |
|-----|------------------------|---------------------------------------|---------------------|-------------|-------------------------------|------|--|--|--|--|--|--|--|--|--|--|--|--|--|
| 1.7 | DArT Services | Level meter, heater, LED studies | ETH/CIEMAT/Cagliari | | specs ?? | ???? | | | | | | | | | | | | | |
| | | Level meter, heater, LED fabrication | ETH/CIEMAT/Cagliari | | | | | | | | | | | | | | | | |
| | | Level meter, heater, LED installation | ETH/CIEMAT/Cagliari | | | | | | | | | | | | | | | | |
| 1.8 | DArT /ArDMIntegration | Mechanical Integration | ETHZ | | Mechanics, pipes, feedtroughs | | | | | | | | | | | | | | |
| | | installation protocol ??? | | | | | | | | | | | | | | | | | |
| | | operations protocol ??? | | | | | | | | | | | | | | | | | |
| 1.9 | ArDM chamber structure | design of the new structure | ETHZ | CIEMAT/INFN | | | | | | | | | | | | | | | |
| | | ArDM new PMT test | ETHZ | CIEMAT/CA | | | | | | | | | | | | | | | |
| | | assembly of the structure | ETHZ | CIEMAT/CA | | | | | | | | | | | | | | | |

- *in general OK for full mechanical integration; timescale seems reasonable*
- *Not clear what is installation protocol + operations protocol; deliverable??*
- *Expecting close collaboration with CIEMAT/... for DArT mechanical integration → Luciano*

Activities of the group (from W.WBS)

WBS 1.11:

| | | | | | | | | | | | | | | | | | | | |
|------|-----|-------------------------|------|--|-----------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| 1.11 | DAQ | DAQ integration studies | ???? | | Design??? | | | | | | | | | | | | | | |
| | | DART DAQ tests | ???? | | | | | | | | | | | | | | | | |

- *DAQ integration and synchronisation likely a non trivial job*
- *Not clear we have time to do that; create a Task force?*
- *Who provides readout hardware ? DAQ ? etc...*

WBS 1.10:

| | | | | | | | | | | | | | | | | | | | |
|------|-------------------------|-------------------------------------|----------------------|------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| 1.10 | Surface operations CERN | DART Installation in the ArDM clone | CIEMAT/CA | ETHZ | | | | | | | | | | | | | | | |
| | | Test at CERN | ETHZ/CIEMAT/Cagliari | | | | | | | | | | | | | | | | |
| | | Preparation of the shipment to LSC | ETHZ/CIEMAT/Cagliari | | | | | | | | | | | | | | | | |
| | | Shipment ArDM chamber to LSC | ETHZ | | | | | | | | | | | | | | | | |
| | | Shipment DART chamber to LSC | ?? | | | | | | | | | | | | | | | | |

- *Tasks seem reasonable; timescale is aggressive → May 2019??*
- *Need detailed schedule (i.e. weekly) from now till May; how do we prepare it?*
- *Need manpower at CERN; need “Resource Loaded” schedule; how do we prepare it?*

Activities of the group (from W.WBS)

WBS 1.12:

| | | | | | | | | | | | | | | | | | | | |
|------|-----------------------|--------------------------------------|-----------------|--------------------|--|---------|--|--|--|--|--|--|--|--|--|--|--|--|--|
| 1.12 | ArDM preparation @LSC | ArDM preparation | ETHZ | | | | | | | | | | | | | | | | |
| | | DART installation | CIEMAT/Cagliari | ETHZ | | | | | | | | | | | | | | | |
| 1.13 | Operations w/o lead | ArDM+DArT safety approval | ALL | | | | | | | | | | | | | | | | |
| | | ArDM filling | ETHZ | | | | | | | | | | | | | | | | |
| | | ArDM commissioning | ETHZ | | | | | | | | | | | | | | | | |
| | | DART filling | ALL | | | | | | | | | | | | | | | | |
| | | DART commissioning | ALL | | | | | | | | | | | | | | | | |
| | | DART first data taking with AAr | ALL | | | | | | | | | | | | | | | | |
| 1.14 | UAr Procurement | Depleted argon procurement from DS50 | LNGS | | | ??????? | | | | | | | | | | | | | |
| 1.5 | Lead belt | design of the new structure | CIEMAT/LSC | | | | | | | | | | | | | | | | |
| | | engineering and safety review | LSC/ETH/CIEMAT | not sure about LSC | | | | | | | | | | | | | | | |
| | | purchase of the lead | LSC | | | | | | | | | | | | | | | | |

- *Tasks seem reasonable; timescale is aggressive → August 2019??*
- *Need to transform a “wish” to operate before fall 2019 into reality; subdivide tasks/responsibilities*
- *Task #A : ArDM preparation@LSC*
- *Task #B : DArT preparation@LSC (slide inside ArDM once ready)*
- *Safety approval of ArDM+DArT (not only recovery dewar) needs to be taken care of.*

Mechanical integration

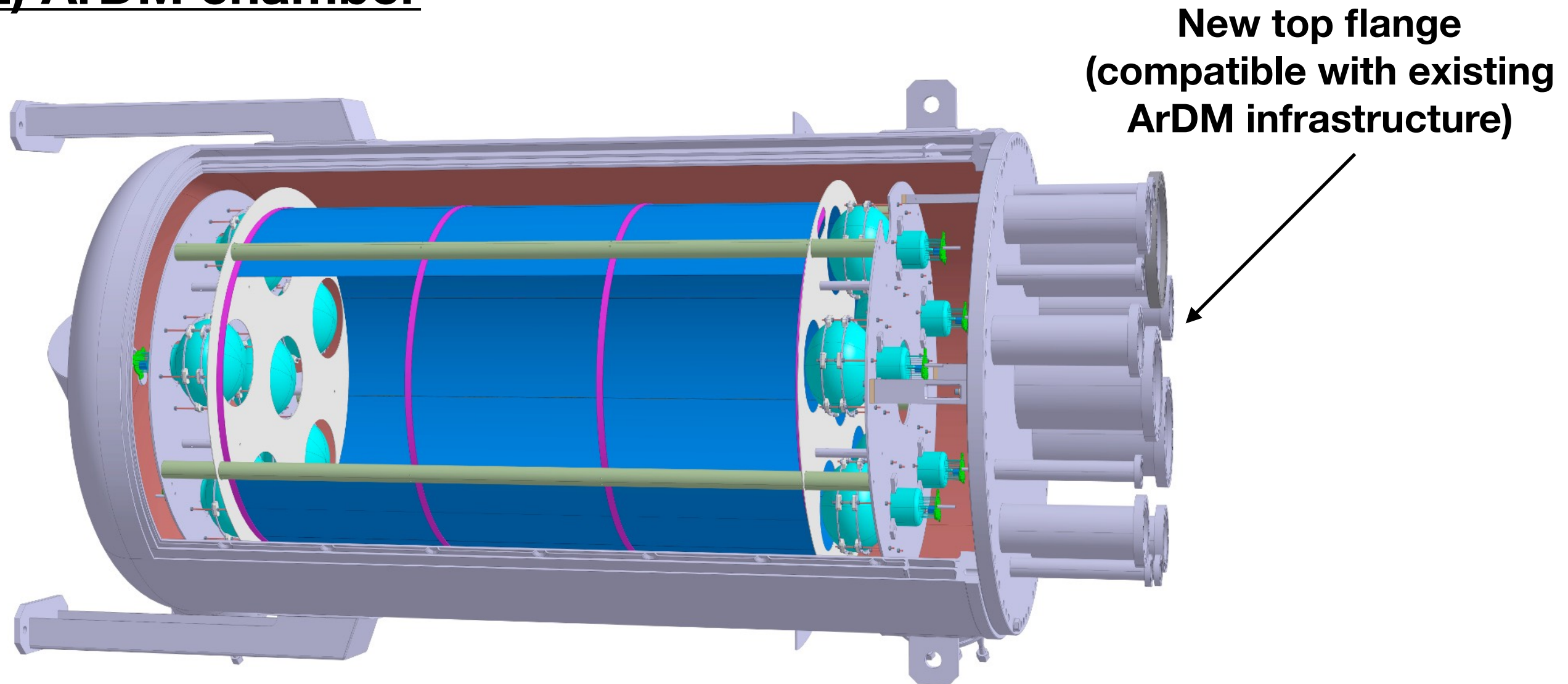
- Work progressing well; seems on schedule for end of March 2019
- 1) DArT chamber



- *Long tubes hold chamber (check → Luciano)*
- *Top flange to be specified and designed → CIEMAT ?*

Mechanical integration

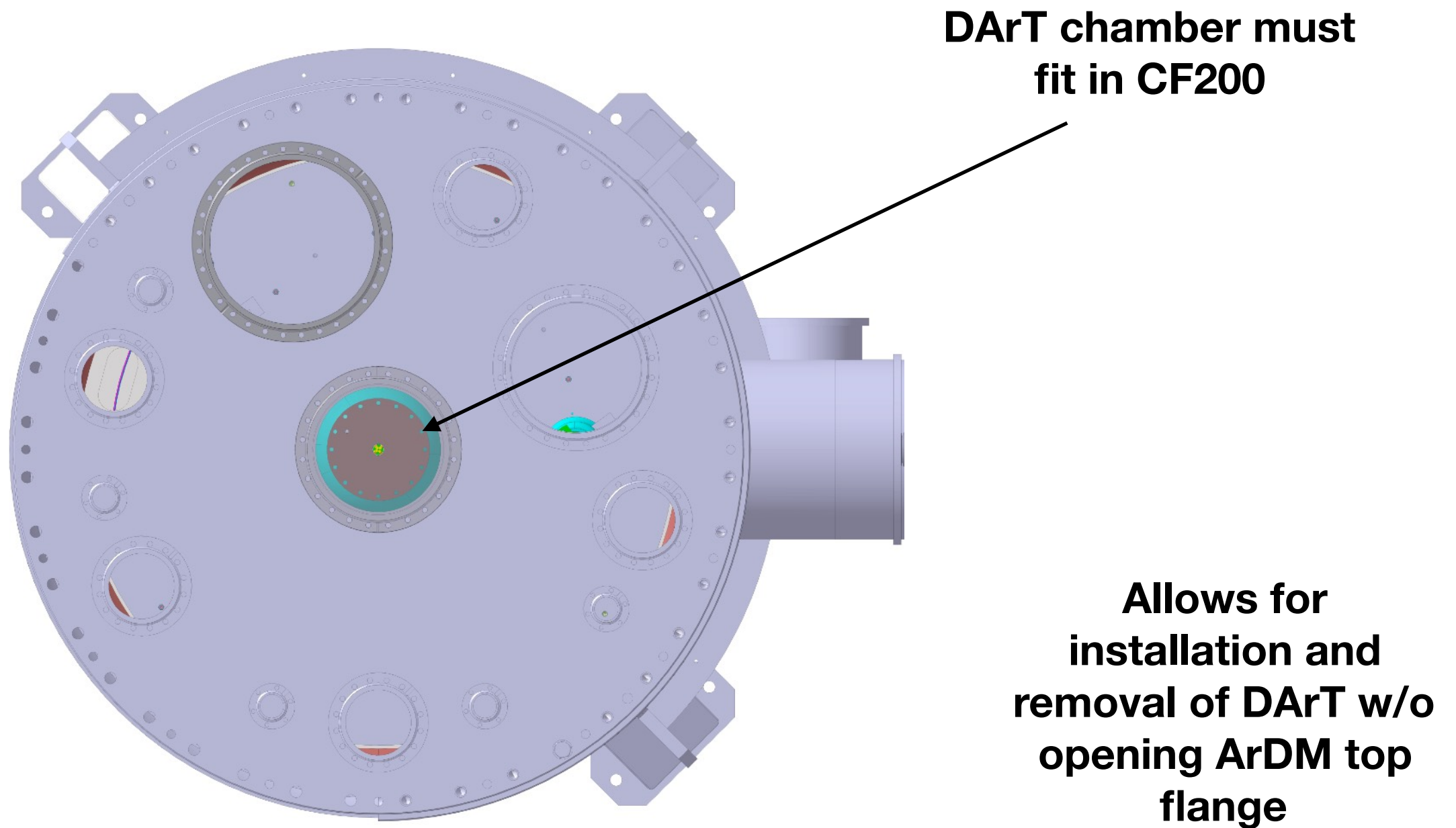
- 2) ArDM chamber



- *PMT layout to be finalized (Simu??)*

Mechanical integration

- Top insertion of DArT into ArDM:



Mechanical integration

- Top insertion of DArT into ArDM:

- Exact location of DArT (height) to be finalised
- Level of LAr in ArDM to be finalised (plan to partially submerge top PMT)

