

# International Muon Collider Design Study



## Accelerator Design meeting

Monday 13/09/2021, 16:00 – 17:00

(<https://indico.cern.ch/event/1072951/>)

*Chair:* Daniel Schulte

*Speaker:* Daniel Schulte and Elias Métral

*Participants (zoom): 42*  
*Akira Yamamoto, Alex Bogacz, Alexej Grudiev, Andrea Chiarma, Anton Lechner, Ben Freemire, Bernd Stechauner, Cary Yoshikawa, Christian Carli, Chris Rogers, Claudia Christina Ahdida, Daniel Schulte, Daniele Calzolari, Donatella Lucchesi, Elena Fol, Elias Métral, fboattin, Francisco Javier Saura, Ivan Karpov, J. Scott Berg, Jean-Marc, Katsuya Yonehara, David Kelliher, Kevin Ronald, Kyriacos Skoufaris, Marchand, Mark Plamer, Nadia Pastrone, Nazar Bartosik, Patricia Tavares, Philippe Lebrun, rfranque, Rob Van Weelderen, Roberto Losito, Roger Ruber, Sergey Arsenyev, Shinji Machida, Simone Gilardoni, Susanna Guiducci, Tiina Salmi, Tord Ekelof, Vladimir Shiltsev.*

## MEETING DECISIONS

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- None.

## MEETING ACTIONS

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- 1: Everybody / conveners** Following the recent decision from the LDG to discuss the deliverables and rough cost of the work programme already on September 22, please send updated info to Elias and Chris asap (ideally before coming Muon Beam Panel meeting on 16/09 at 14:00).
- 2: Elias and Chris** Organise a meeting this Friday 17/09 to discuss the results of Action 1.
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## RE-CONVENING AFTER THE SUMMER BREAK (DANIEL SCHULTE)

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- Daniel reminded the key workshop goals.
- **RECENT NEWS from LDG (which implies that we need to act before the planned 3rd Community meeting on 06-08/10/21):**
  - o **Wants to discuss the deliverables and rough cost of the work programme on September 22**
  - o **Workshop with the panel on October 8 to define deliverable plans including resources – maybe shifted slightly to avoid overlap with our community meeting**
- Consequences for us (see also Actions 1 and 2): Try and make sure that the information is complete and up to date (contact your conveners and Elias and Chris (see email sent by Daniel) • as soon as possible • **if possible before this Wednesday 15/09, panel will meet Thursday**)
  - ⇒ What needs to be done?
  - ⇒ What are the resources required?
  - ⇒ Who is interested in contributing?
- Conclusion from Daniel
  - o Please make sure the information is flowing for the deliverables and interest of work
  - o Please prepare the detailed work programmes
  - o Do not forget the MoC
    - ⇒ Identify who can sign it in your institute
    - ⇒ And who would represent your institute
    - ⇒ Contact is Alexia: [alexia.augier@cern.ch](mailto:alexia.augier@cern.ch)

- Rob Van Weelderen raised the point of the cryogenics and where it would fit. If not done wisely it will become a visible cost-driver. After the meeting, he gave more information reported below:
  - o The power deposition figures going around are far and above currently dealt with in accelerators and individual magnets. To bring the part to be taken at low temperatures down is a prerequisite for the muon collider project.
  - o The cryogenics comes in at multiple points:
    - ⇒ One is in the overall infrastructure,
    - ⇒ The other is in the vast variety of magnet-designs and associated distributed cooling for the accelerator ring.
  - o So it will have to appear at different points of the design and in differing "quality", but they will be strongly interdependent.
  - o The main driver will be in the magnet designs, where one must seek to
    - ⇒ 1) operate with coils at the highest possible temperatures (balancing cable costing with all other costs involved, especially cryo),
    - ⇒ 2) get as much coolant out of the magnets as possible (which is why I used the term "dry" magnets). With what I mean that "the magnet design should strive, where possible to go to warm iron and conduction-cooled coils". A summary of these issues are addressed in my talk at the "High Field Accelerator Magnets - Roadmap Preparation June 1 and 3, 2021" (see <https://indico.cern.ch/event/1032199/timetable/?layout=room>),
    - ⇒ 3) R&D on magnets has to address the optimization of cooling load, at which temperatures they land, and extraction pathways and only from that one could address the overall infrastructure costing.
- Daniel then showed the list of main deliverables (with tasks)
  - o In light, it means that it appears here also but it is covered elsewhere (such that it is not counted twice).
  - o These slides are a tool for the panel to define the scenarios => Needs to be converted into text at some point but not needed for next week.
  - o AlexejG mentioned some issues in the text for RF => This will be corrected by Daniel.

## **1. PREPARATION FOR THE 3RD MUON COMMUNITY MEETING (06-08/10/21) AND THE PARAMETERS DISCUSSION(DANIEL SCHULTE)**

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- Elias showed the website and agenda for our 3rd Community Meeting prepared with Chris and Daniel and answered to the 2 questions which had been raised in a previous conveners meeting. Please don't hesitate to send us any other feedback as usual and many thanks in advance!

## 2. AOB (EVERYBODY)

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- Daniel reminded us that this meeting is a working meeting and we can look at work in progress, we don't need to see the final work.
- Following a question from TordE, please remember that our organisation can be found on our website (<https://muoncollider.web.cern.ch/organisation>).
- The next meeting will take place next Monday 20/09 and the agenda can be found here: <https://indico.cern.ch/event/1077393/>.

*Reported by E. Métral and D. Schulte*