



IDRC Recommendation: open discussion

R. Ferrari, R. Santoro



The International Detector R&D Committee request

- The objectives of the project
- The anticipated schedule on which the objectives will be met
- The funding available to the project, and the leadership arrangements within it
- The extent to which the project is a CEPC-specific development
- Manpower resources available for the project, including type (student, faculty, engineer, etc) and FTE (question added by us)

■ The objectives of the project

- Build a prototype partially readout with SiPMs (10x10x100 cm³) to address a series of technical questions
 - The readout of SiPMs with an ASICS
 - The assessment of the linearity response of the system
 - The grouping readout
 - The potential in exploiting timing measurements to improve PID and provide longitudinal shower position
 - Mechanics construction issues with capillary tubes
- Exploit technical solutions potentially scalable to a real 4 π calorimeter
 - Engineering drawings of a realistic detector integrated into a full simulation to assess the physics performances
- A study of the impact of the material placed in front of the calorimeter
 - TB measurements + simulation
- Any idea on how to extrapolate the energy resolution for hadrons?

- **The funding available to the project**
 - Some funding from INFN, Sussex and RBI to build the next prototype (it should be tested on beam at end of next year)
 - Participation into AIDA++
 - Planning to apply in 2020 for an INFN (3-year) Grant addressing a “hadronic”-size prototype
 - ...
- **The extent to which the project is a CEPC-specific development**
 - **The project is inserted in the IDEA experiment design, proposed for the experimental program at CepC or FCCee.**

The International Detector R&D Committee request

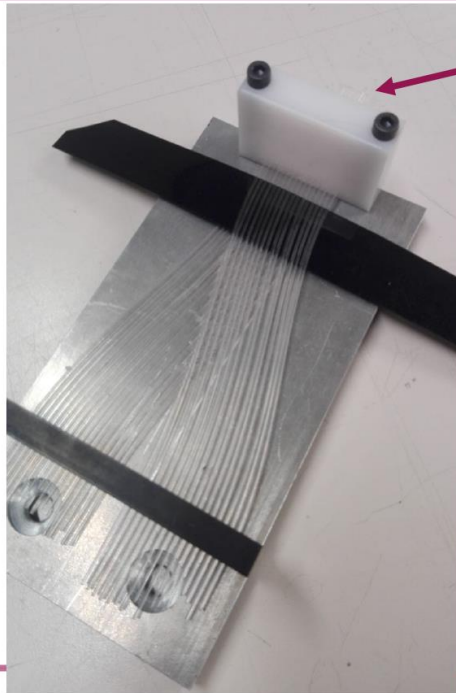
- Manpower resources available for the project, including type (student, faculty, engineer, etc) and FTE
 - INFN
 - Sussex
 - RBI
 - South Korea
 - ...

Buckup

Option A

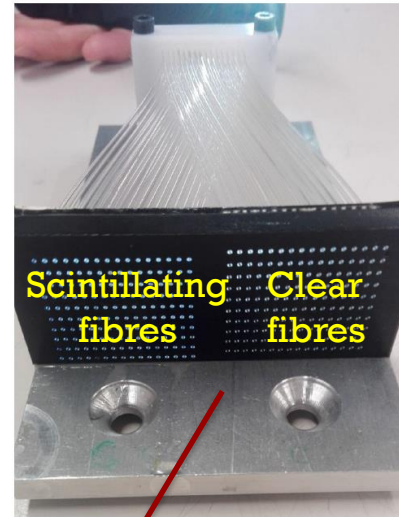
Calorimeter rear part

7



Calorimeter rear part

Glued fibers to be able to mill/polish them

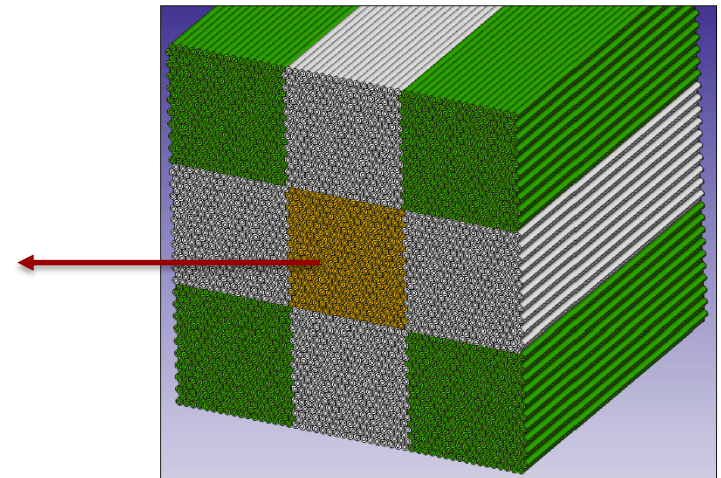
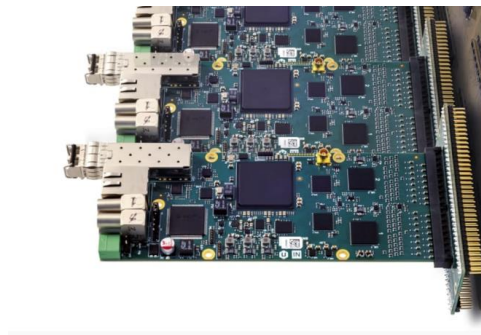
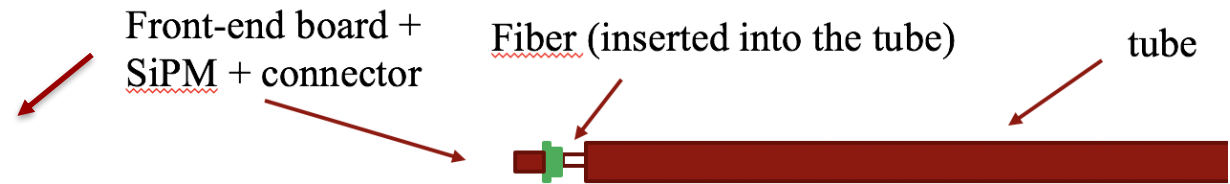
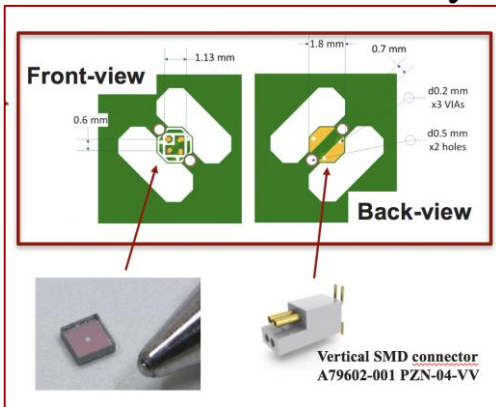


9

Here there will be a unique FEE board equipped with all SiPMs. The board will be fixed to the mechanical support in one go and from the back (or from the side) there will be flat cables running towards to the FERS system

Option B

- The front-end board + SiPM will be glued to the tip of the fiber
- Both the functionality and optical coupling for the basic unit will be qualified before the module assembly starts



The prototype in numbers

- 8 modules to be readout with PMTs
 - 16x20x8 tubes 1m long + 20% spares (3100 tubes)
- 1 module to be readout with SiPMs
 - 16x20 tubes 1.2m long + 20% spares (390)
- Fibers 1.4m long: we need to group them at the end of the calorimeter
 - 1440 C + spares (10-20%)
 - 1440 Sc + spares (10-20%)
- 16 PMTs to be qualified among the available
- SiPMs
 - 320 SiPMs (S14160-1315PS) + 10 spares
 - 10 SiPMs (S13615-1025) to test option B

