RD-FCC/WP1
Physics & Software Meeting

News

April 1st 2021

Patrizia Azzi (INFN-PD)

Paolo Azzurri(INFN-PI)

Latest news from FCC@CERN

News from ECFA

- **ECFA Detector R&D Roadmap:** https://indico.cern.ch/event/957057/

All relevant information is located on the indico site above

Input meetings:

Session I (in general collider oriented), 19/02/21
Talk I: HL-LHC (incl. flavour physics)
Talk II: strong interactions at future colliders
Talk III: strong interactions at future fixed target facilities
Talk IV: future linear high energy e+e- machines
Talk V: future circular high energy e+e- machines *(M. Dam)*
Talk VI: FCC-hh *(M. Aleksa)*
Talk VII: muon collider

Session II (in general non-collider oriented) 22/02/21:
Talk I : neutrino short and long baseline
Talk II: astro-particle neutrinos
Talk III: DM-like facilities
Talk IV: decay facilities
Talk V: low energy facilities

Symposia
Nine one-day symposia are foreseen as listed below.
Task Force 1: Gaseous Detectors
Symposium date: Thursday 29.4.2021 Indico link to agenda
Task Force 2: Liquid Detectors
Symposium date: Friday 9.4.2021 Indico link to agenda
Task Force 3: Solid State Detectors
Symposium date: Friday 23.4.2021 Indico link to agenda
Task Force 4: Photon and PId Detectors
Symposium date: Thursday 6.5.2021 Indico link to agenda
Task Force 5: Quantum and Emerging Techologies
Symposium date: Monday 12.4.2021 Indico link to agenda
Task Force 6: Calorimetry
Symposium date: Friday 7.5.2021 Indico link to agenda
Task Force 7: Electronics and On-detector Processing
Symposium date: Thursday 25.3.2021 Indico link to agenda
Task Force 8: Integration
Symposium date: Wednesday 31.3.2021 Indico link to agenda
Task Force 9: Training
Symposium date: Friday 30.4.2021 Indico link to agenda

Latest news from FCC@CERN

News from ECFA

- **ECFA Workshops on Physics, Experiments and Detectors**
  - **Three working groups (discussed in rECFA meeting on 12 March)**
    - **Group 1: Physics potential**
      - ➔ **Conveners: Juan Alcaraz, Jenny List, Fabio Maltoni, James Wells**

        Mandate attached to the agenda
    - **Group 2: Physics analysis methods**
      - ➔ **Conveners: Patrizia Azzi, Dirk Zerwas, Fulvio Piccinini**

        Mandate attached to the agenda
    - **Group 3: Detectors**
      - ➔ **Organization pending completion of ECFA Detector R&D Roadmap**

  - **Next steps (IAC meeting on 1 April)**
    - **Approach the conveners formally**
    - **Discuss startup of activities**
    - **Programme Committee for ECFA workshops: mandate, conveners, relations with IAC and groups**

Latest news from FCC@CERN

FCC PED Study: Detector Concept

- **Extensive discussions in the last two PED Coordination meetings**
  - Concluded to create a "task force" to prepare a proposal for
    - The organization, mandate, and deliverables of the "Detector Concepts" effort within FCC PED
    - Its relation with ECFA R&D Roadmap and other R&D efforts
  - Mogens Dam accepted to chair this committee
    - Include
      - ➔ Members from the other (connected) PED efforts: software & physics performance & MDI
      - ➔ Detector experts
      - ➔ External members
    - Members (who have accepted so far to be part of the committee)
      - ➔ M. Aleksa, N. Bacchetta, A. Blondel, P. Collins, M. Dam (chair), G. Ganis, P. Giacomelli, P. Janot, E. Perez, F. Simon, G. Wilkinson
    - Pending confirmation
      - ➔ W. Riegler
  - First meeting will most probably be held on 7 April at 3pm (tbc).

Latest news from CEPC@IHEP

- Workshop from 14-17 April to discuss a new detector baseline.
- contribution expected from our group on clustering studies
- activity on mechanics for a silicon tracker starting between Pisa+Mi

Latest news on FCCAnalysis tools

- Big News: proposal to translate the LEP real data into EDM4HEP.
  - Big advantage to analysis to test on real data! Can help thesis in Italy?
- FCCAnalysis improvements: more examples developed for jet reconstruction, retrieve of objects from EDM4HEP
  - New instructions on applying Vertexing to tracks.
  - Tracks can be from Delphes, but proposal to have EDM4HEP tracks from FullSim of the Drift Chamber (more later)
- Setting up for MC production: an intermediate production will be just remaking the same of December with the bug fixes and addition of BES
  - Addition of NEW MC (Whizard, KKMC) in progress, will take longer to develop the new cards: good place for helping out.

new activity starting: particle flow development

Biagio Di Micco (RM3), Iacopo Vivarelli (Sussex), Sofia Vallecorsa(CERN), Patrizia Azzi (INFNPD), Lorenzo Pezzotti (PV/CERN)

AIDANNOVA Task 12.5 started on 01/04/2021

Involved Institutions:	INFN - Roma 3, Roma 1, Padova, Pavia CERN Sussex
Duration:	01-04-2021 - 31-03-2025
Target of the project:	Build up a Machine Learning based Particle Flow algorithm for the reconstruction of light jets in Dual Read Out Calorimeter
Software development and integration:	The algorithm will be developed in the Pandora Particle Flow Software Tool Kit, use KEY4HEP for the event data model and interfaces. PANDORA integration in KEY4HEP already started in CEPC.

Project development:

1. definition of the proper layout for a proper photon identification and energy measurement compatible with the dual readout calorimeter principle;
2. optimisation of the clustering algorithm, as a compromise between simplicity of the algorithm and efficiency
3. develop Machine Learning based PID, using truth level track information and muon identification;
4. construct a regression algorithm for particle-jet assignment and jet energy reconstruction

Next steps & meetings

- Next Physics Performance Meeting on April 19 15:00
- Next IDEA Software&Physics meeting ~22 April?
- FCCWeek June 28th: not a lot of time. Need to have concrete planning of what we want to present to be effective in the next months.