Report on the Scientific Policy Committee Activities since January 2016

On behalf of the SPC

T. Nakada

SPC meeting March 14-15

- Programme
  - Report on the machine start-up (F. Bordry)
  - Report on LHC Experiments&Computing (E. Elsen)
  - Comprehensive report on the LHCC activities by the LHCC chair (F. Forti)
  - Annual Progress Report for 2015 (F. Gianotti)
  - Information on the Medium-Term Plan for the Period 2017-2021(F. Gianotti)
  - Discussion of a Draft Note from the SPC Working Group on the Council Question concerning R&D Activities for a Future High-Energy Frontier Machine

SPC meetings May 2

- Programme
  - Discussion of a Draft Note from the SPC Working Group on the Council Question concerning R&D Activities for a Future High-Energy Frontier Machine
  - DUNE experiment and ideas for the European contribution (A. Rubbia and M. Thomson – Oral)
  - Discussion scientific programme - Medium-Term Plan for the period 2017-2021 (F. Gianotti)

SPC meetings June 13-14

- Programme
  - Report on the machines (F. Bordry)
  - Report on LHC Experiments&Computing (E. Elsen)
  - Annual Progress Report for 2015, final document (M. Steinacher)
  - The High-Luminosity LHC Project (F. Gianotti)
  - The Medium-Term Plan for the period 2017-2021 and Draft Budget of the Organization for the 63rd Financial Year 2017 (F. Gianotti)
  - Draft Note from the SPC Working Group on the Council question concerning R&D activities for a future high-energy frontier machine
  - Recent results from the MoEDAL experiment at the LHC (J. Pinfold)

Focus on the March-May-June meetings

- To prepare for the discussion on the MTP, by gathering relevant information:
  - High Luminosity LHC upgrade and Phase-2 upgrade for ATLAS and CMS
  - Development in the accelerator based neutrino programme
    - CERN neutrino platform
    - European participation in the experiments in the US and JP
  - R&D and design studies for future the energy frontier machines (FCC, Linear Colliders, …)
  - R&D for advanced acceleration technology (AWAKE)
  - diversity in the scientific programme, e.g. “Beyond collider physics”, …

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SPC draft report to the Council

- The Council seeks guidance from its Scientific Policy Committee in order to understand (energy frontier machines):
  1. the extent to which these various concepts are competitive, complementary, realistic or redundant, in terms of both physics and technology,
  2. whether CERN should continue with its current efforts (for example CLIC) or consider adopting other programmes (for example a muon collider), and
  3. what should be the priorities for CERN.

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- SPC analysed the evolution since the last Strategy update in 2013:
  - in physics: No established new particle, "Higgs Like" looks more and more like Higgs, no conclusive signal to establish new physics in the precision frontier, **yet**.
  - in R&D and design studies for future high energy frontier machines: FCC(-hh, ee, eh) and LC's advancing
  - in new development: Chinese plan for CEPC and SPPC, new idea for muon cooling in Europe, …

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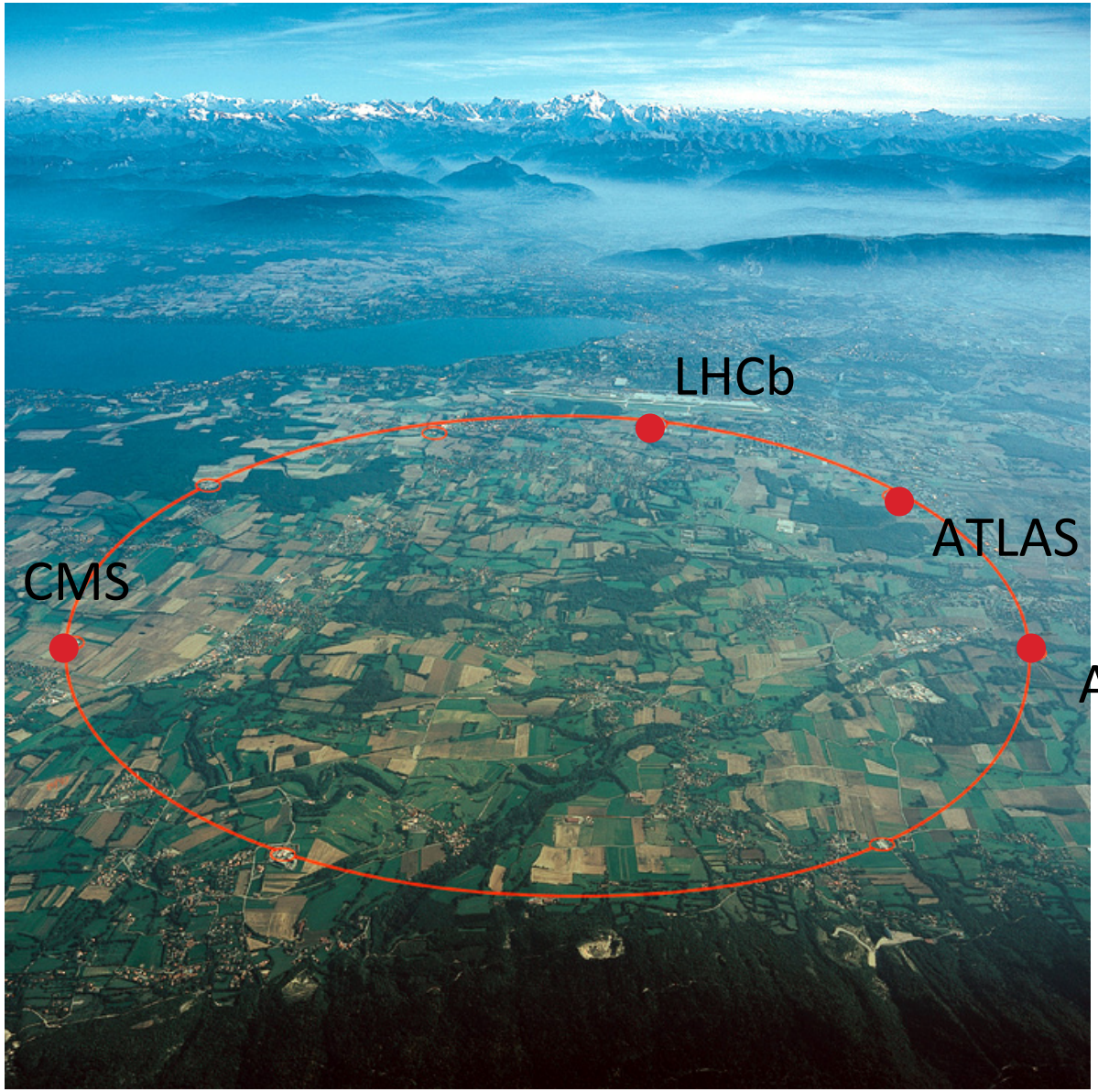
Final document in September (→ December open session presentation).

There are more than AACL



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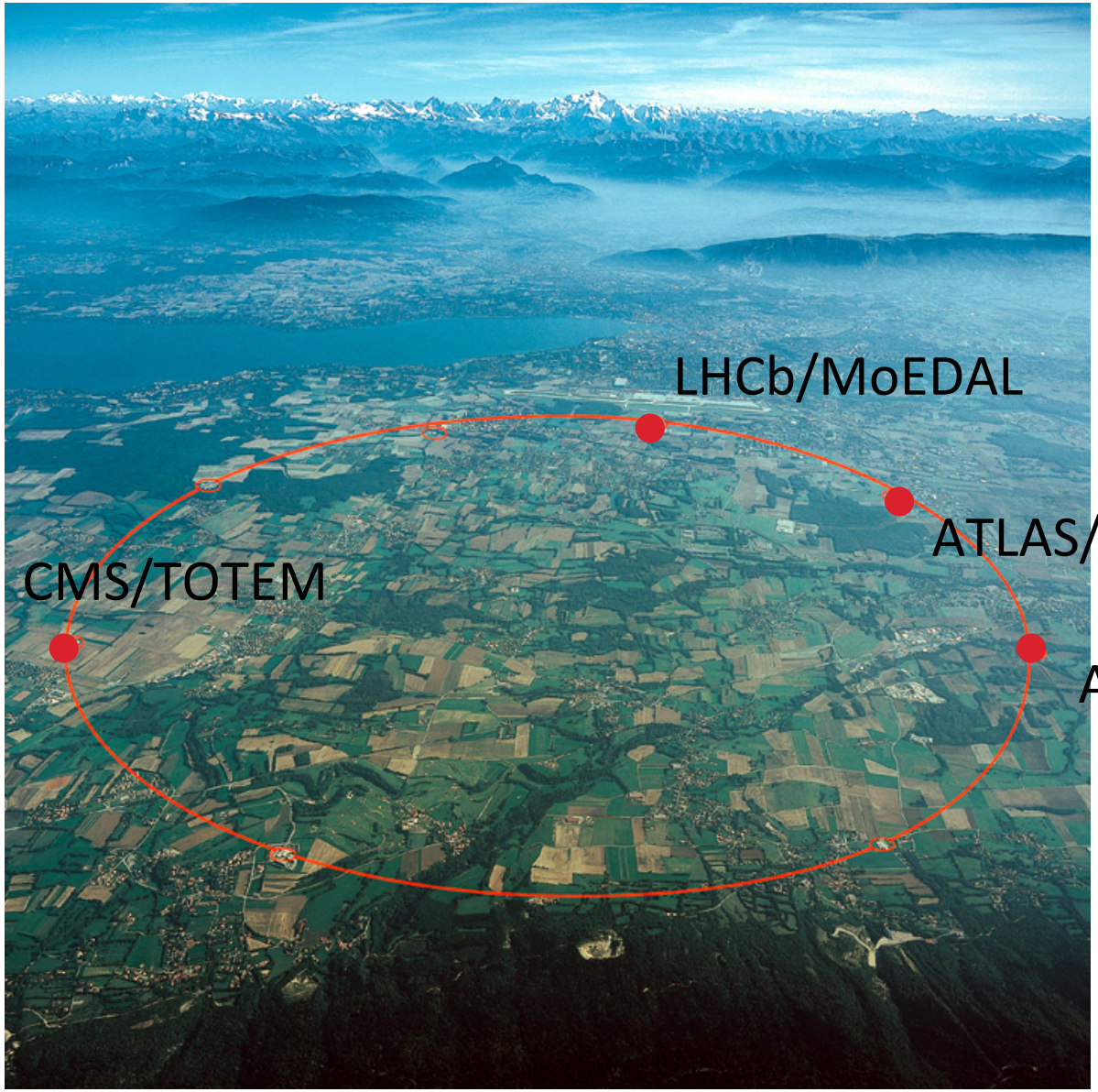


TOTEM

CMS

MoEDAL

LHCb

LHCf

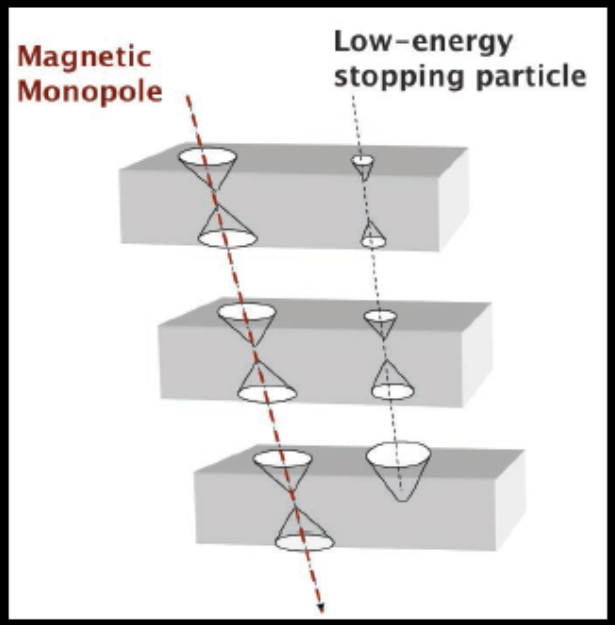
ALICE

MoEDAL detectors

J. Pinfold

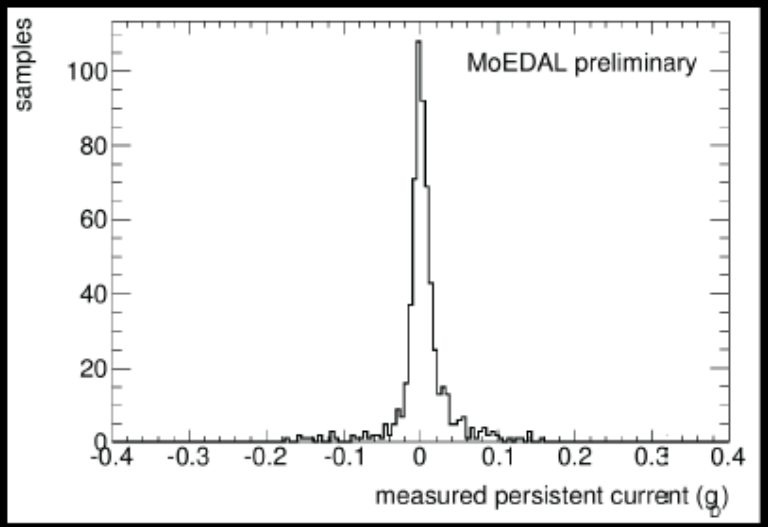
Nuclear Track Detectors

Tracking resolution: 10μm/pit (~10 pits)
Pointing resolution (to the IP): ~1 cm
Charge resolution: 0.1e



Trapping Detector SQUID

Magnetic charge resolution < 0.1g_D



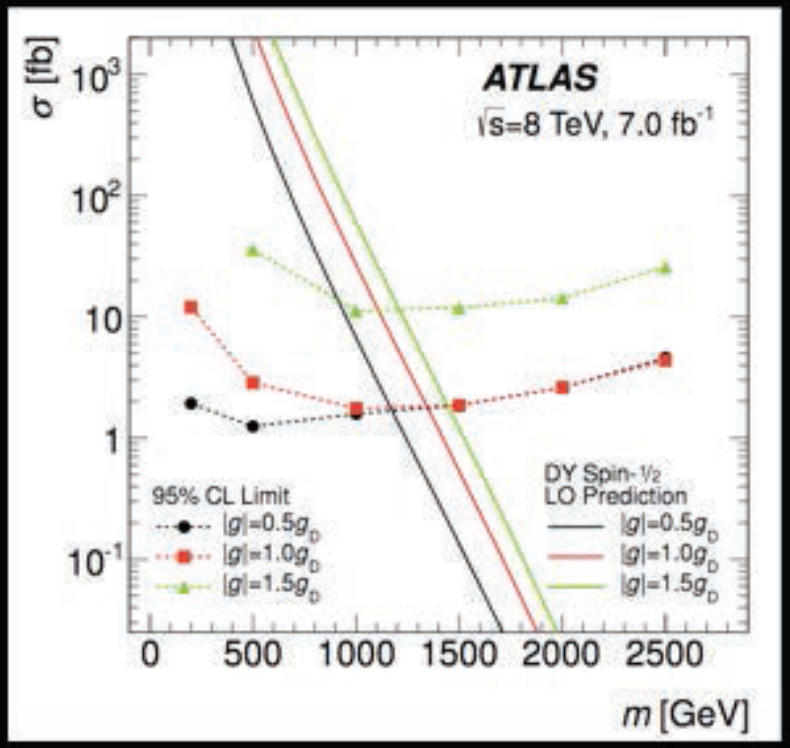
TimePix Chips (2cm x 2cm)

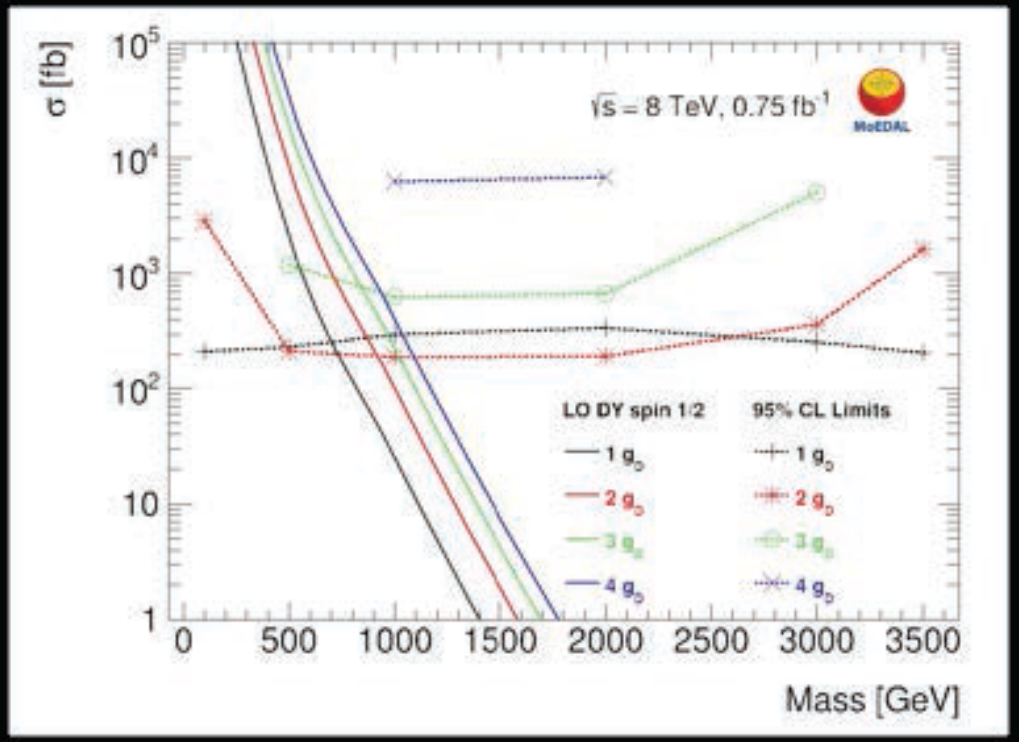
Each pixel instrumented (TOT/Cnt /Arr.Time
Pixel size: 55mm x 55mm
Silicon thickness 300 μm → 1mm

MoEDAL detectors surrounding the LHCb vertex detector

Recent MoEDAL result on the limit of magnetic monopole

J. Pinfold





- *Even with this prototype & low lumi MoEDAL probed multiple magnetic charges which other LHC detectors find challenging*