

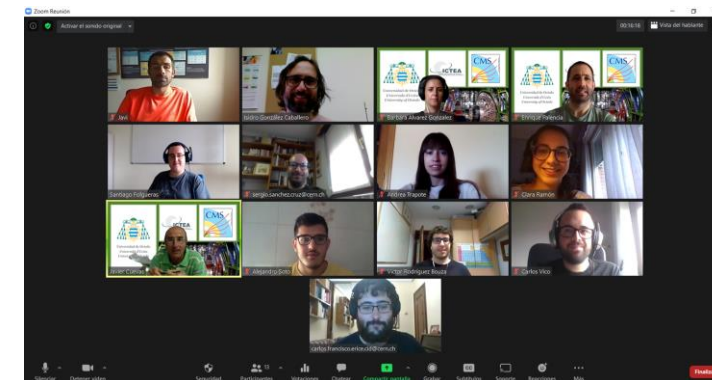
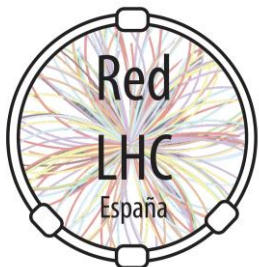
Grupo de Física Experimental de Altas Energías de la Universidad de Oviedo



Universidad de Oviedo



- **12 members** (current): **3 professors**, **3 tenure track**, **4 PhD students**, **2 Master students**
- **~1 M€** from projects in 7 years:
 - 2 European (ITN, Action cost)** | **3 National** | **2 Regional** (+ 2 networks, + CPAN, + Clarín, + RyC...)
- **LHC activity fully committed to CMS (>20 years)**: **Data analysis** (SM, Top and Higgs properties, Higgs and SUSY searches, other BSM searches), **Muon POG**, **L1T**, **DT Muon detector** (operation, validation and upgrade) & **Computing** (deployment, development and support)
 - **Detector** activities focused in **DT Muon Detector operation and upgrade** (phase I and HL-LHC)
 - **Analysis** activities structured around channels with **signatures with 2 or more leptons**
- **8 PhD thesis** since 2008 (all related to CMS data analysis)
- Main authors of **>50 CMS papers** since the beginning of the LHC
- **~100 International conferences** since 2010 (approx. 1 per person per year)

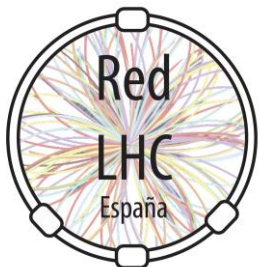


Enrique Palencia Cortezon - November 6, 2020 - 1

Planes de análisis en el RUN-3

- We plan to:
 - use the experience gained in Run 1 and 2
 - naturally extend the previous activities
- In particular:
 - **Top/Higgs/SM**: (further) increase precision, better understanding of systematic uncertainties
 - **BSM**: displaced tracks (LLPs)
- **Run 1 and 2 highlights**
 - **SM** cross section measurements: **WW** (5 & [7](#) & [8](#) TeV), **WZ** (5 and 13 TeV [2015](#), [2016](#))
 - **Top** quark physics: **ttbar** cross section measured at every \sqrt{s} ([5-7-8-13](#) TeV), tW production ([13 TeV](#))
 - **Higgs** boson [discovery](#) in 2012, [H \$\rightarrow\$ W⁺W⁻](#) channel
 - **Higgs** boson **properties**: **ttH** ([multileptons](#)), [H \$\rightarrow\$ W⁺W⁻](#)
 - **BSM** Physics: [Direct](#) and [indirect](#) search for stop in SUSY models; searches in final states with two or more leptons, including SUSY [EWK](#) ([dilepton](#) and [multileptons](#)) and [Strong](#) interpretations

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Planes de operación en el RUN-3

- CMS Operation mainly related to **DT** involvement. Central shifts taken as **DCS**, **DQM**, and **Trigger**

[DT operation]

- **DOC** (Detector on Call) → 2-3 months per year
- **POA** (Prompt Offline Analysis) → 2-3 months per year

[DT Longevity Task force] → Coordinating

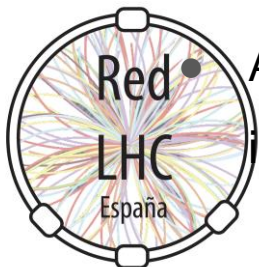
[Muon validation & certification] → 4 months per year

[DQM development and operations]

- **Coordinating** (L2) **CMS DQM** core and **Data Certification** (DC) groups
- Task comprises: **Online** (@P5) and **Offline** (Integration of CMS subsystems contributions) operation and issues, and Prompt/ReReco Data Certification for Collisions/HI/Cosmic datasets

At present working on **LS2 upgrades for Run 3**, including: DQM Framework migration for

improvements, new Run Registry (RR) interface and DQM automatization with AI (ML4DQM/DC)



Planes para HL-LHC

- **Upgrade of the L1 Muon trigger** to cope with the HL-LHC expected trigger rate
 - **DT**
 - **R&D reconstruction algorithm for trigger primitives**
 - **Online SW:** Integration of online control software in the CMSSW and DQM system
 - **L1T**
 - **R&D muon reconstruction algorithm (OMTF)** to improve the time resolution, the efficiency and purity of reconstruction and the momentum resolution
 - **R&D track-muon correlator algorithm**
- **Physics analysis:** continue/extend Run 1-3 research activities

