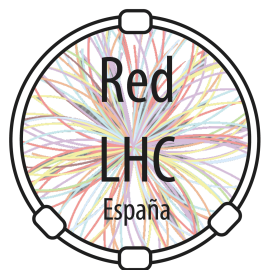
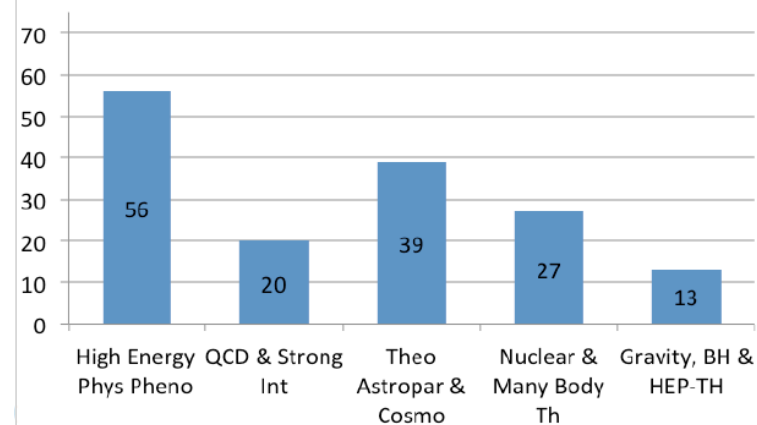




99 members

- 22 UV
- 10 CSIC
- 4 Emeriti
- 1 Beatriz Galindo
- 4 RyC
- 6 CIDEAGENT
- 35 PhD

Pub TEO por líneas de investigación 2019
(Web of Science: Article, Review)



4th Red LHC Workshop
4-6 Nov 2020



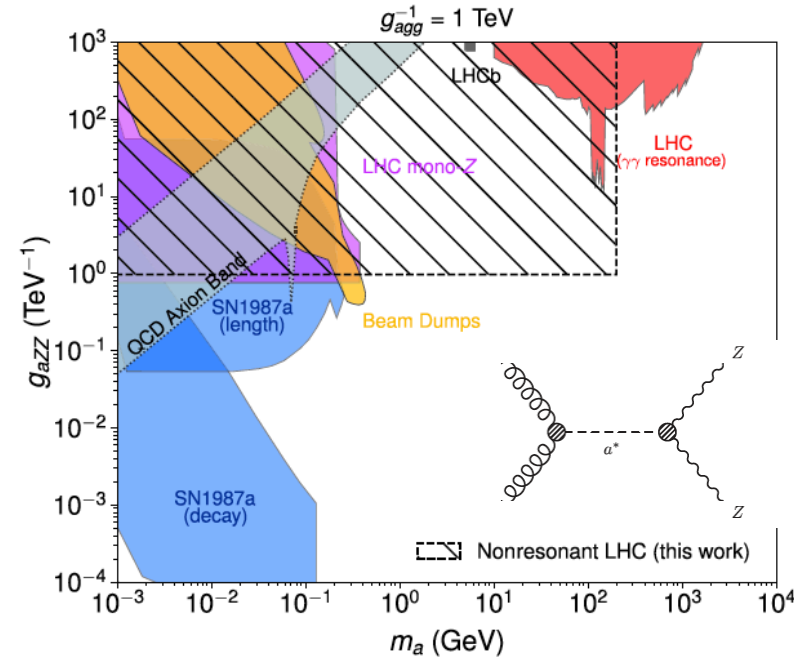
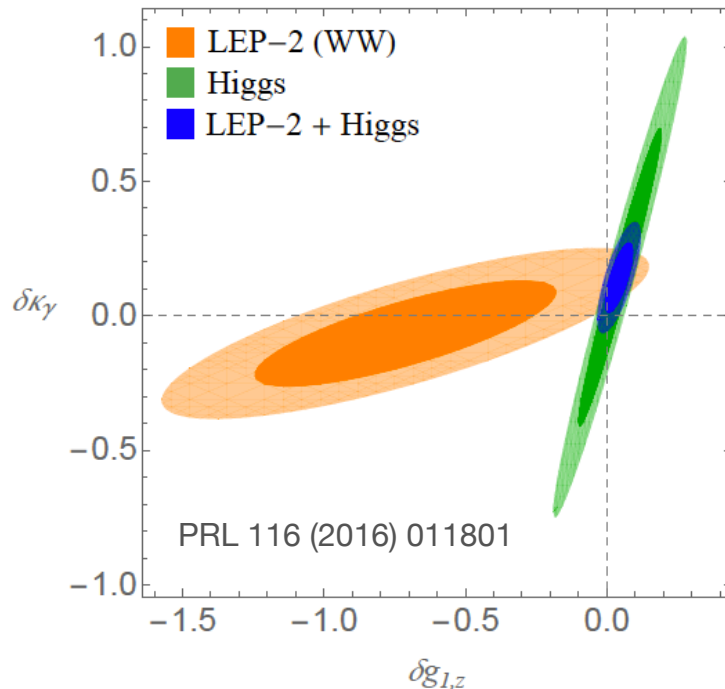
Disclaimer: a short selection of IFIC's theory interests



Planes para el RUN-3 y HL-LHC

Verónica Sanz + (Cambridge, King's, UAM)

- SMEFT global analysis, tails due to pseudo-Goldstone bosons: axions and axion like particles (ALPs)
- see also talk on Wed



Martín González-Alonso, Víctor Bresó

- Analysis of New Physics effects in precision measurements (Electroweak, Higgs, ...) using EFT, e.g. anomalous triple gauge couplings

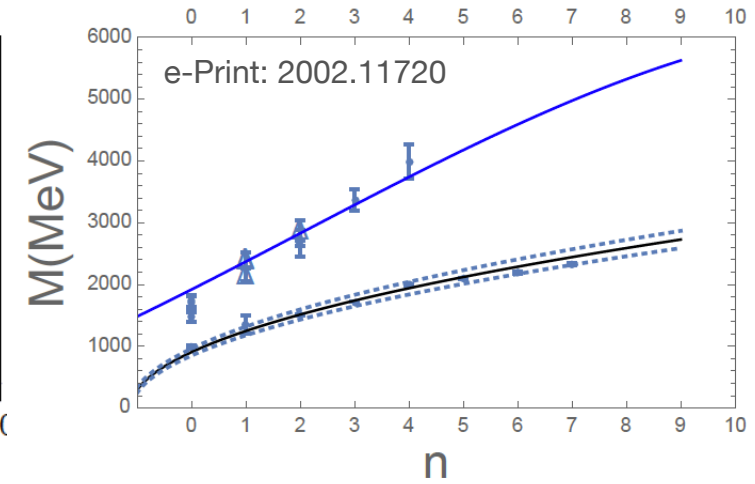
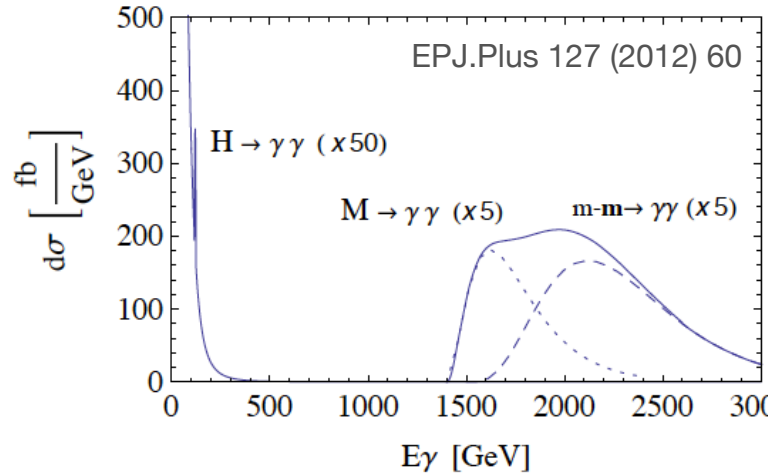


Planes para el RUN-3 y HL-LHC



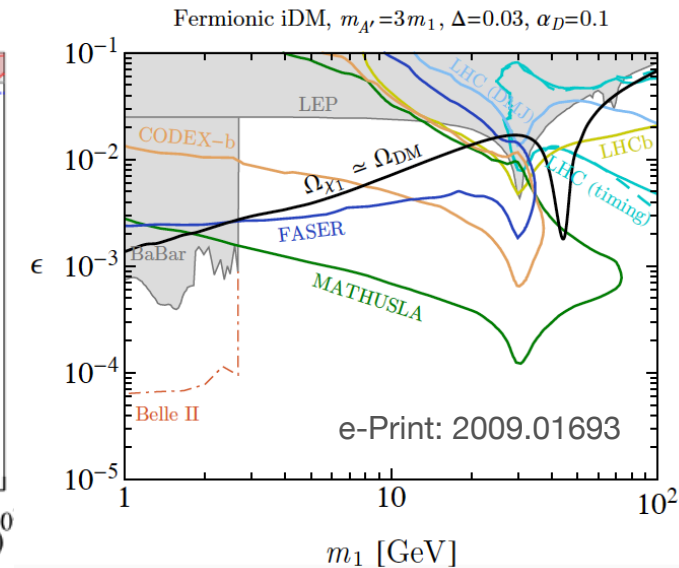
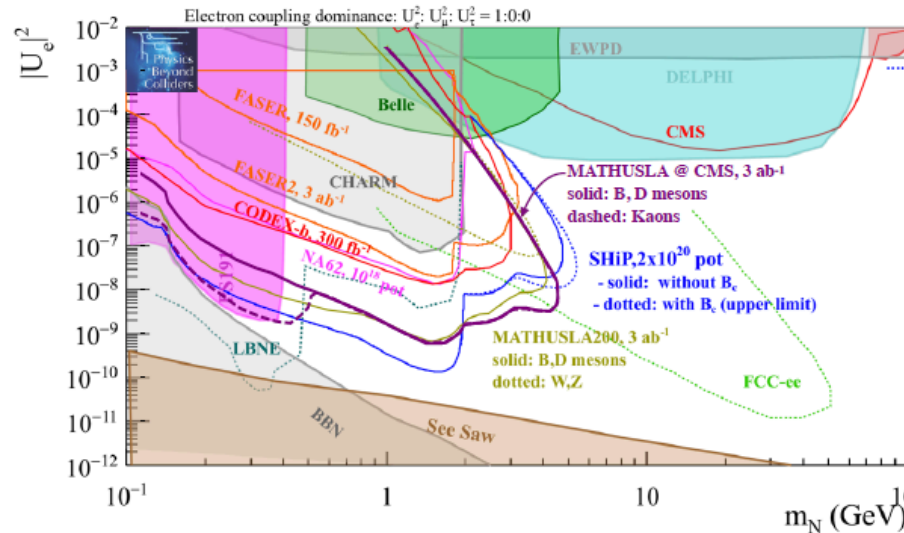
Vicente Vento (MoEDAL), Matteo Rinaldi

- search for magnetic monopoles and/or monopolium
- Modifies the tail of the diphoton production distribution (ATLAS and CMS)
- search for heavy glueballs at LHCb



José Zurita (MATHUSLA, Emma Torró)

- search for Long-Lived Particles (LLPs)

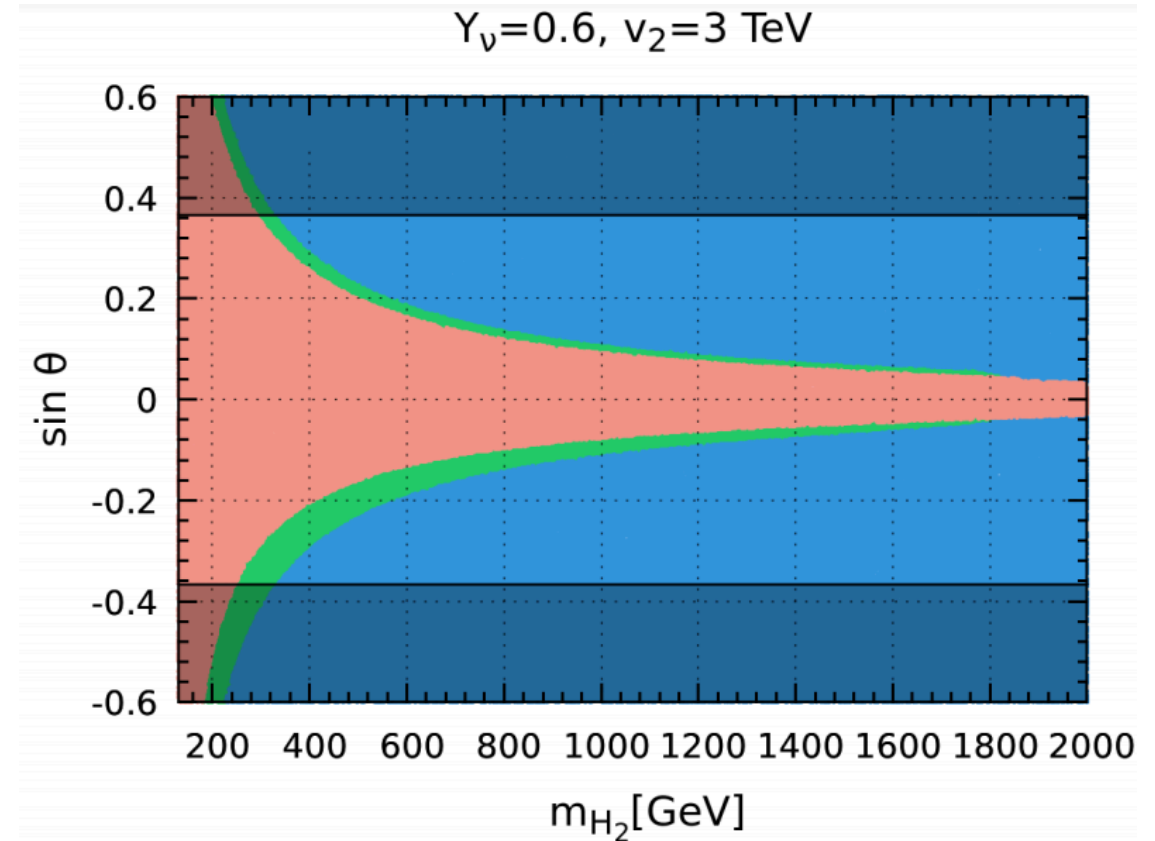




Planes para el RUN-3 y HL-LHC

José W. F. Valle, Sanjoy Mandal

- Invisible Higgs decay measurement to probe dynamical low-scale seesaw models, i.e. mixing angle between two CP-even Higgses that restores vacuum stability in singlet scalar extended SM
- Heavy neutral leptons (HNLs) signatures
 - mass $\sim O(1 \text{ TeV})$: boosted fat jets.
 - mass $\sim O(10 \text{ GeV})$: decays with a displaced vertex.

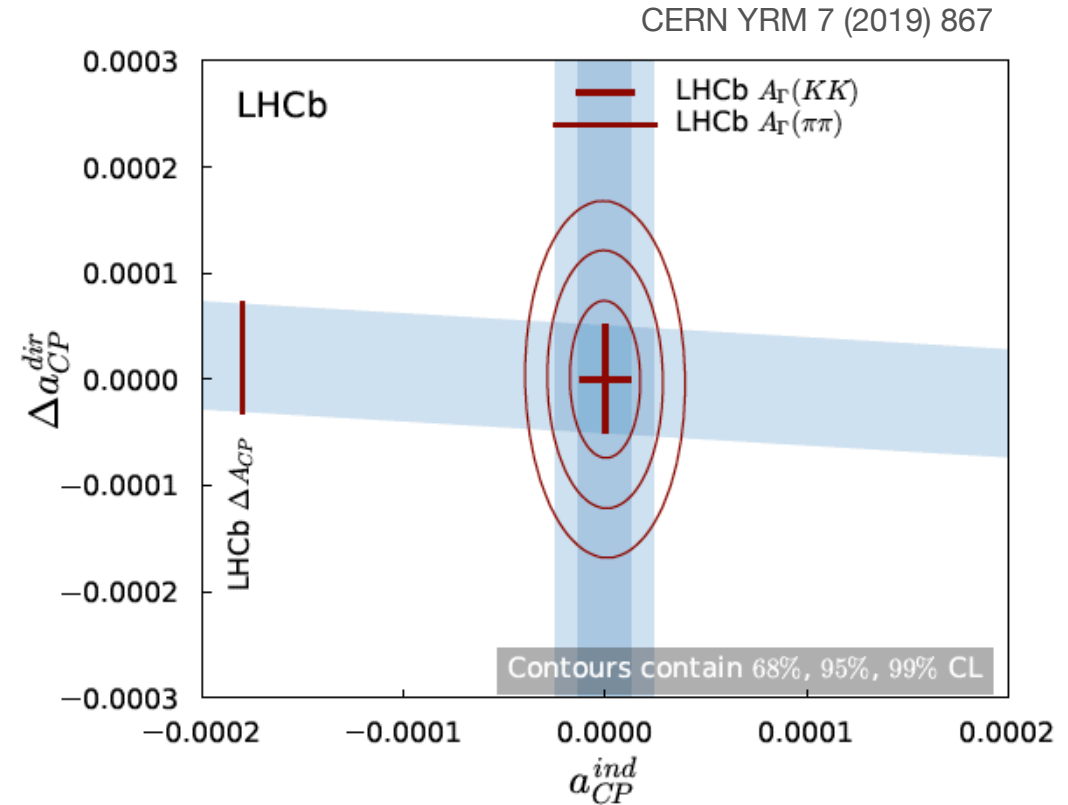




Planes para el RUN-3 y HL-LHC

Antonio Pich, Luiz Vale Silva, Eleftheria Solomonidi

- CP violation in the quark flavour sector, particularly in charm physics (theory prediction to match experimental uncertainty)
- Flavour anomalies and Lepton flavour universality (see talk on Thu)

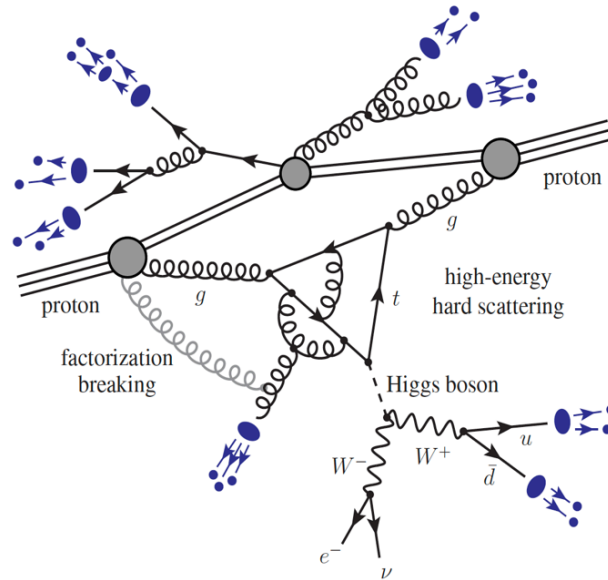
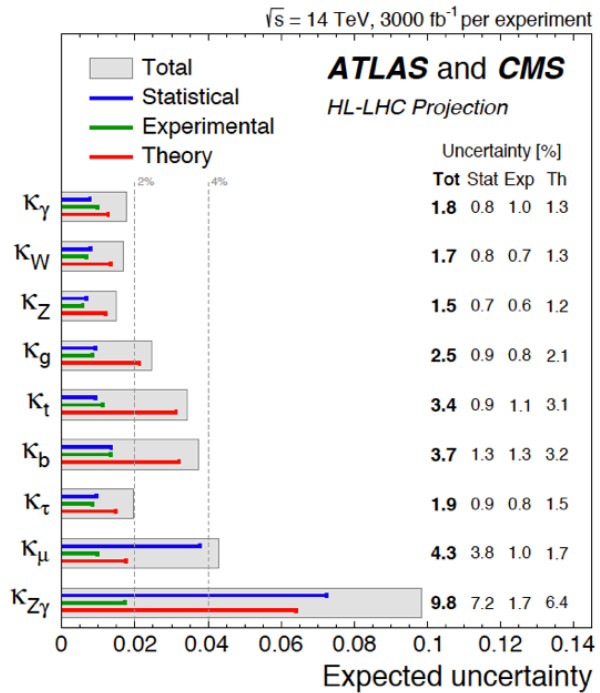


current world-average uncertainty larger than the full scale of this plot



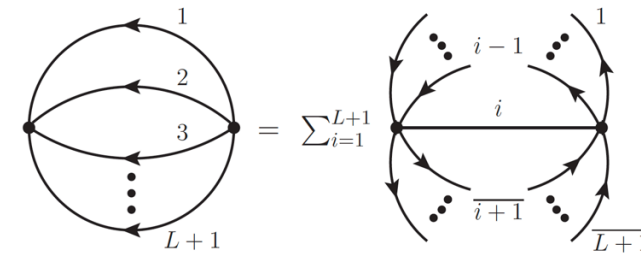
Planes para el RUN-3 y HL-LHC

Cepeda et al.,
CERN YRM 7 (2019) 221



Germán Rodrigo, Selomit Ramírez, Judith Plenter, Jesús Aguilera, Andrés Rentería + (MPI, DESY, Sinaloa)

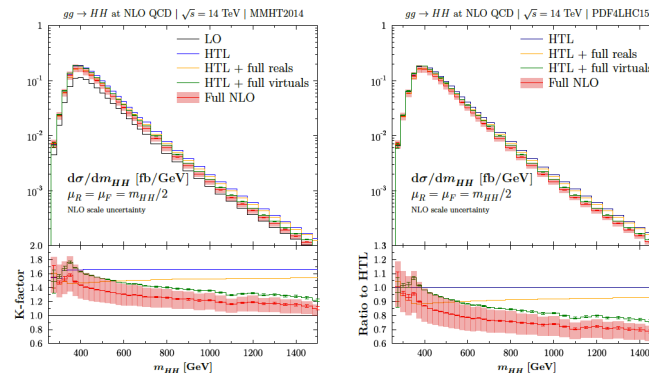
- Reformulation of QFT directly in the four physical space-time dimensions (Loop-Tree duality)



PRL124
(2020) 211602

- factorization breaking at higher quantum orders

theory uncertainties scaled by a factor 2 (beyond present state of the art)



Francisco Campanario, Jonathan Ronca, Iván Rosario

- Higgs pair production at NNLO *JHEP* 04 (2020) 181
- di-photon production in VBF at NLO *JHEP* 06 (2020) 072