

Intro to LHC DM Working Group public meeting (22/06/2018)

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LHC DM WG ORGANIZERS

How the DM WG operates

LHC Dark Matter Forum / Working Group (2014–)

ATLAS, CMS, LHCb, theory

http://lpsc.web.cern.ch/lpsc/index.php?page=dm_wg

- Make the most of what little we know of DM
- Complement so far diverse collaborations between experiment and theory
- Pay attention to good ideas from theory
- Help make things happen in experiments

The DM WG so far has worked on **focused efforts**:
selected topics leading to arXiv write-ups

Typically

- meeting with short presentations on some of the potential topics
 - see December meeting <https://indico.cern.ch/event/682235/timetable/>
- develop topic in open meetings
- keep discussing on-list and in smaller groups of interested participants:
lhc-dmwg-contributors@cern.ch [[subscription link](#)]
- **conclude and write up after circulation and review on mailing list**

List of topics covered so far

Summer 2015

<https://arxiv.org/abs/1507.00966>

[Dark Matter Forum] Reach consensus on a **common set of benchmark models** for ATLAS and CMS early Run-2 searches

Winter 2015

<https://arxiv.org/abs/1603.04156>

Within the framework of the DMF simplified models, **present results and compare** Direct Detection (DD) / Indirect Detection (ID) / collider searches

Winter 2016

<http://arxiv.org/abs/1703.05703>

Agree on how to **present searches for mediators** of DM interactions in visible decays together with searches to DM particles, add lepton couplings to DMF benchmark models

Spring 2017

<https://arxiv.org/abs/1705.04664>

Arrive at a joint **estimation of theory uncertainties** for *precision DM searches* at colliders (e.g. mono-jet)

2017 - 2018

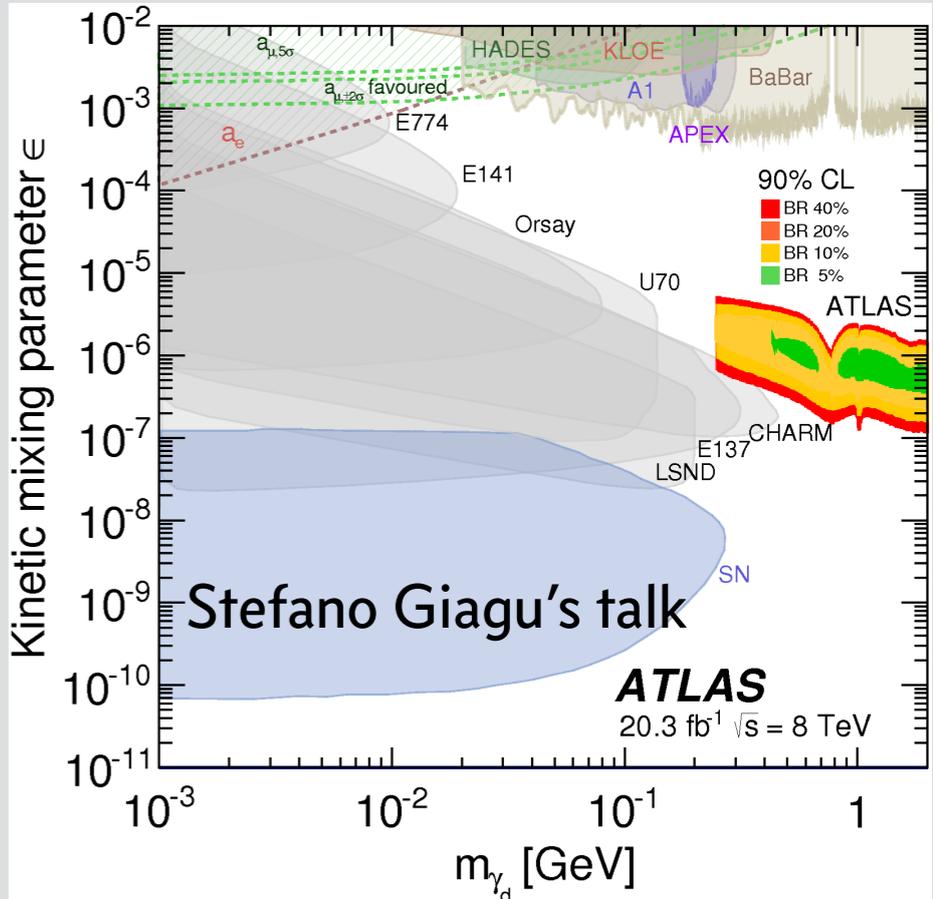
Develop **scalar sector** and **t-channel** benchmark models

TODAY'S MEETING FOCUS

**Dark photons:
connection to existing searches and to relic density**

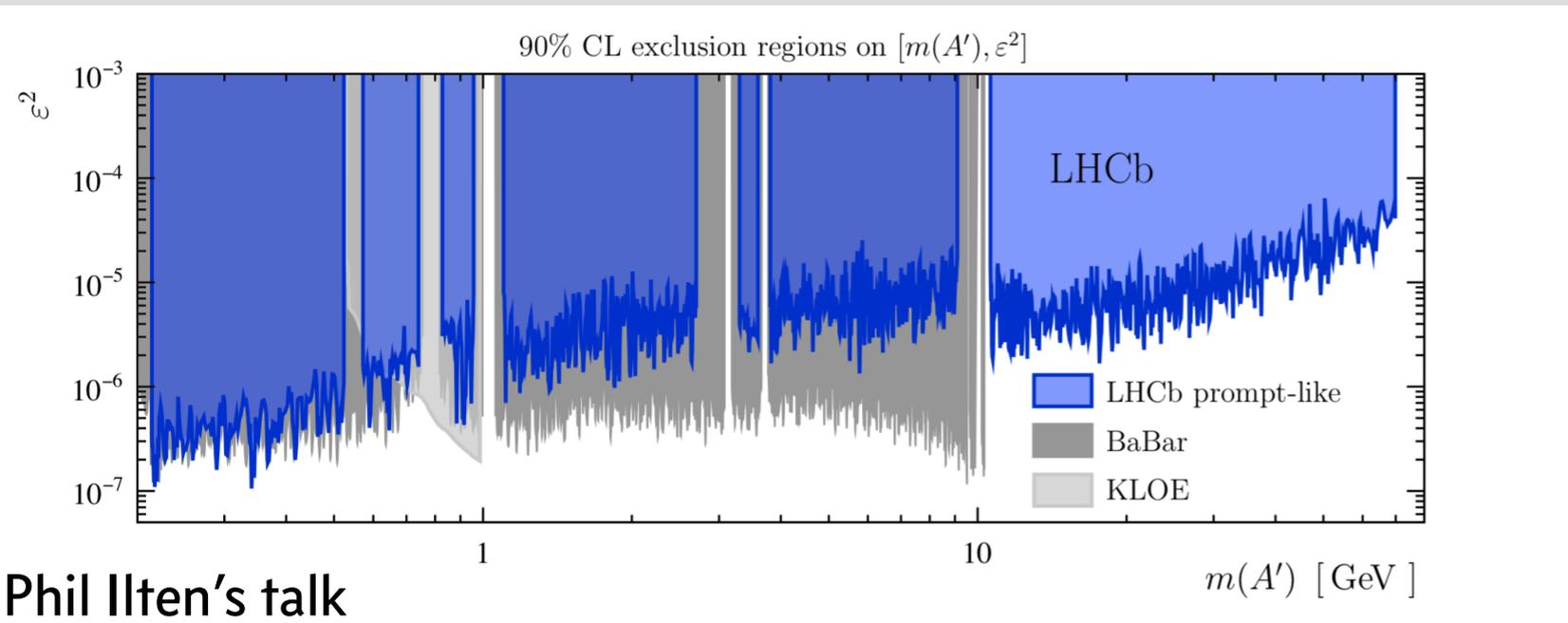
Why dark photons

<https://arxiv.org/pdf/1409.0746>



- Beyond WIMP paradigm investigated by DM WG so far
- Simple model as a starting point for more complex dark sectors
- Already used as benchmarks for LHC searches - examples:

<https://arxiv.org/pdf/1710.02867.pdf>

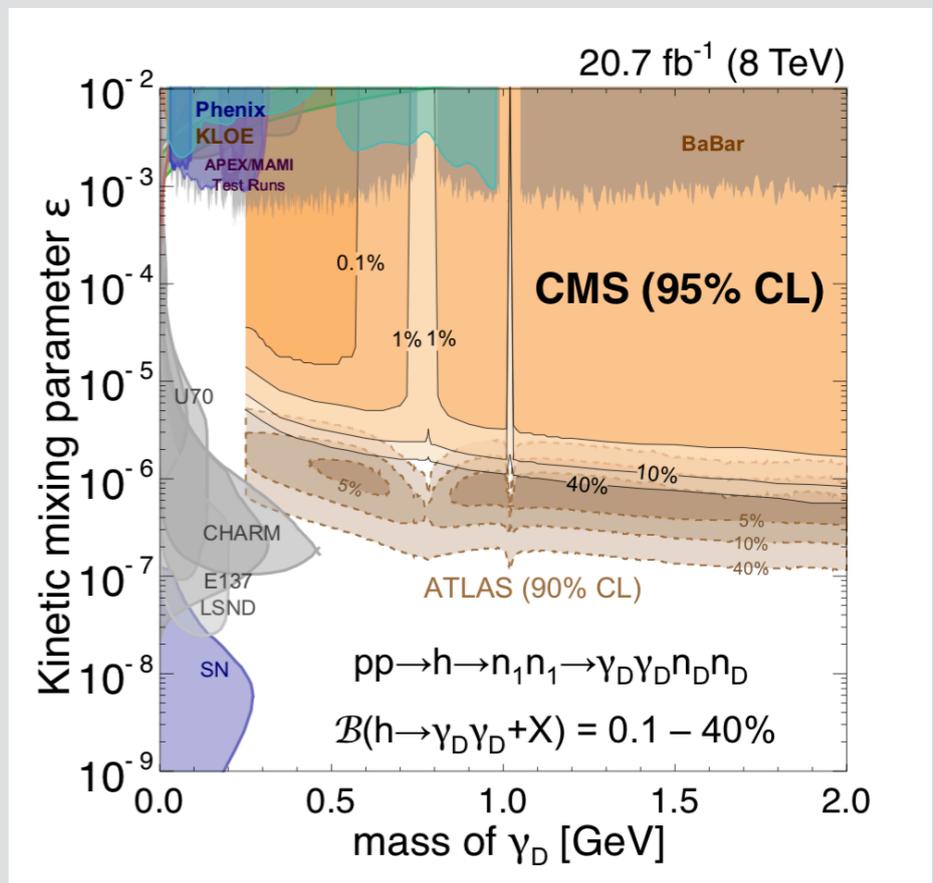


Phil Ilten's talk

Goals of today's meeting

- Compare and contrast models used at LHC and beyond
- Discuss how existing results (e.g. searches for vector mediators) can be recasted in the same framework
- Start discussing connections to relic density

<https://arxiv.org/pdf/1506.00424.pdf>



Andreas Albert's talk

