



JRA1-WP19 = LHC-Combine, aka HONEXCOMB



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 824093

Plan of the presentation:

1. Progress made during the year towards the objectives

(Provide details for each task)

2. Deviations from planned objectives and tasks, and their impact on the progress of the Work Package

(Explain the reasons for deviations, the consequences and the proposed corrective actions)

3. Deliverables and milestones

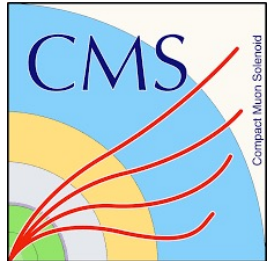
(Please list all the deliverables and milestones due before the end of October 2021, as indicated in Annex I)

4. Other significant achievements

0 – Reminder of the HonexComb idea



ALICE



“ Inter-experiment combination of heavy-ion measurements at the LHC ”

- Animation of a vivid forum
- Cross-experiment combination work (papers)

+ other actions

- Comparing methods or observables (Centrality...)
- Producing or endorsing comparison plots
- Identifying (and solving) tensions

1 – Organizational progress

Identify 4 spokespersons / contacts + hosts for 4x1 year of postdoc

- Alexander Kalweit (CERN) in Alice + Jacek Otwinowski (INP, Krakow, Poland);
- Iwona Grabowska-Bold (AGH UST, Krakow, Poland) in Atlas;
- Giulia Manca (INFN Cagliari, Italy) in LHCb;
- Raphaël Granier de Cassagnac (Polytechnique, France) in CMS.

+ 2 theorists as of early 2021

- Christian Bierlich (Lund, Sweden) Jacopo Ghiglieri (Subatech, France)

Set up communication tools

- Wiki : <https://twiki.cern.ch/twiki/bin/view/Honexcomb>
- Mailing list (120 people) honex-comb@cern.ch created ([feel free to subscribe](#))
- Meetings : kick-off in January 2020, 12 meetings as of today (10 remote, does not help)

→ <https://indico.cern.ch/category/11797/>

What's
new?

+ 2 boss

+ 20 people

+ 5 meetings

1 – Topics and progress

Discussed in meetings (#talks)

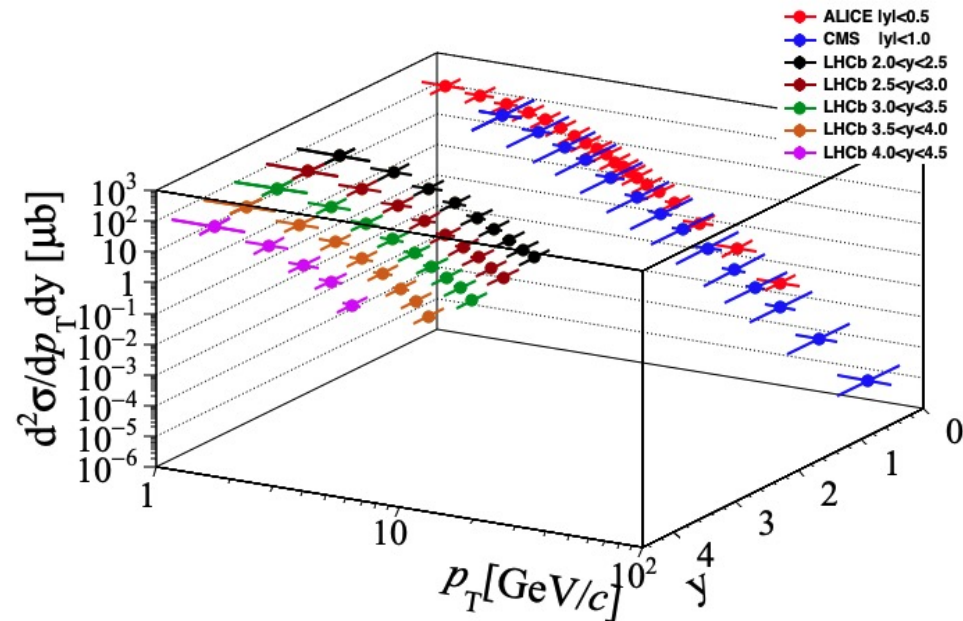
- Heavy Flavours* (8)
- nPDF (3)
- Quarkonia (3)
- Light-by-light scattering (3)

From proposal

- + Centrality definition
- + Top quarks
- + Jets* (2)
- + Anomalous em moment of tau

+ First identified common work

Small team to work out a first combination in complementary phase space (ALICE+CMS+LHCb)
Open charm cross section (total + differential)



(see Sun in [meeting #11](#))

1 – Topics and progress

Discussed in meetings (#talks)

- Heavy Flavours* (8)
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From proposal

Measured cross sections (in nb) :

CMS(2015) = $120 \pm 46 \pm 28 \pm 12$

ATLAS(2015+18) = $120 \pm 17 \pm 13 \pm 4$

Extrapolation to common fiducial region
proper combination → 10% improvement,
Looking forward to 2018 CMS result

(see Krintiras in [meeting #11](#))

+ Second identified common work

Small team to work out a first combination
in the same phase space (ATLAS+CMS)
in order to raise the significance

New

1 – Topics and progress

Discussed in meetings (#talks)

- Heavy Flavours* (8)
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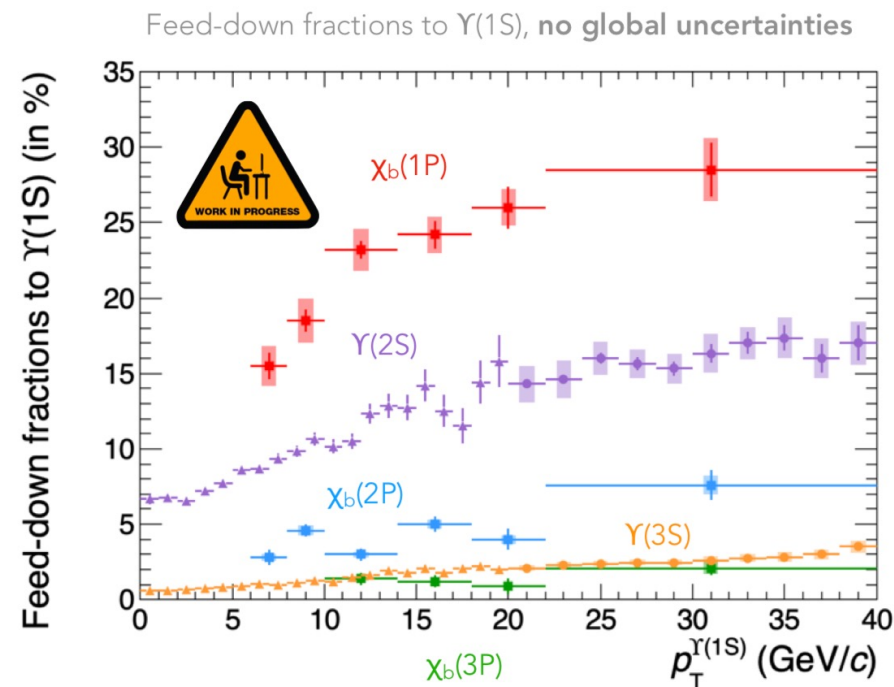
From proposal

- + Centrality definition
- + Top quarks
- + Jets* (2)
- + Anomalous em moment of tau

+ Third identified common work

Small team to work out the feeddown contributions to the Upsilon states (CMS+LHCb)

New



(see Damaz in [meeting #12](#))

2 – Deviations from plans

What's
new?
+ 4 postdocs

Delay in hiring the postdocs

- In CMS @ Polytechnique: Florian Damas (from Alice) joined in on Feb. 1st
- In LHCb @ INFN Cagliari: Jiayin Sun, joined on Sep. 1st (but was already around)
- In ALICE @ INP, Krakow: Sándor Lökös, joined on Sep. 1st with Jacek Otwinowski
- In ATLAS @ AGH UST, Krakow: Yuriy Volkotrub, joined on Nov. 1st

First x-collaboration paper are not there yet

- But three groups are working
- At least one abstract submitted to Quark Matter'22 (4-10 April 2022)
- A natural deadline for our papers?

Remark: Overall, starting such a federative active remotely was not optimal

Further extension of Strong-2020 would be more than welcome!

3 – Deliverables and Milestones

D19.1 = Vivid Forum / January 2020 / <https://twiki.cern.ch/twiki/bin/view/Honexcomb>

MS32 = Kick-off / January 2020 / <https://indico.cern.ch/event/872670/>

D19.2 = Road Map / April 2020 / <https://twiki.cern.ch/twiki/pub/Honexcomb/WebHome/Roadmap.pdf>

D19.3 = Cross-experiment papers / “After month 12, for instance month 12, 24, 36, 48” → In progress...

D19.4 = Outlook report paper / ”Before the end” → Not sure to have gathered the workforce...

Work package number	19															
Work package acronym	LHC-Combine															
Work package title	JRA1-Inter-experiment combination of heavy-ion measurements at the LHC															
TASKS/Subtasks	Year 1				Year 2				Year 3				Year 4			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
1. Animation of a forum		1														
2. Cross-experiment combination work				2												

4 – Another significant achievement

An official LPCC heavy-ion working group was created

- Important if we move to formal joint publications
- Important if we want to live beyond Strong-2020
- <https://lpcc.web.cern.ch/content/lhc-hi-wg>
- Dedicated mailing list [[subscribe](#)]

Posterity

Conveners are →

First meeting: Jul 7th

- Nice collection of talks
- Stimulating discussions

Conveners:

- ALICE: Alexander Kalweit and Marta Verweij
- ATLAS: Iwona Grabowska-Bold and Jiangyong Jia
- CMS: Raphael Granier de Cassagnac and Yi Chen
- LHCb: Giulia Manca and Benjamin Audurier
- Theory: Liliana Apolinario and Urs Wiedemann
- Reach all through lhc-hiwg-admin@cern.ch