The strong interaction at the frontier of knowledge: fundamental research and applications

JRA1-WP19 = LHC-Combine

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STRONG-2020 Kick-off meeting
October 23-25, 2019

JRA1: LHC-Combine (aka HonexComb)

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

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

JRA1: LHC-Combine (aka HonexComb)

- Inter-experiment combination of heavy-ion measurements at the LHC
- WP objectives
  - improve communication between the 4 collaborations in the heavy-ion field
  - establish an LHC data-combination working group
- WP tasks
  - Animation of a vivid forum
  - Cross-experiment combination work
- WP means
  - 4x1 year of postdoc to animate the forum and initiate the work
  - (to be complemented with local funds)

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												

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JRA1: Update on progress

- Not really started yet ☹
  - Wanted to start “early 2019”, right after the end of the second LHC run
  - But greenlight in summer 2019, with people already busy with 1st results
  - No local manpower to start (at least in CMS)
- Postponed to after Quark Matter (Nov. 4-9)
- honex-comb@cern.ch created (feel free to subscribe)
  - 42 subscribers, incl. 4 CMS, 3 ATLAS, 4 LHCb, 8 theorists…

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JRA1: ToDo's

- Identify contacts in each experiments
  - LHCb = Giulia Manca, CMS = RGdC, ALICE and ATLAS = TBD
- Talk to the (new) experiment management
- Organize a virtual gathering (Dec.)
  - Announced in the heavy-ion communities (opening to all collaborators)
  - Review the results presented at Quark Matter
  - Identify area of (combination) work
- Identify postdoc candidates
  - Need complementary funding

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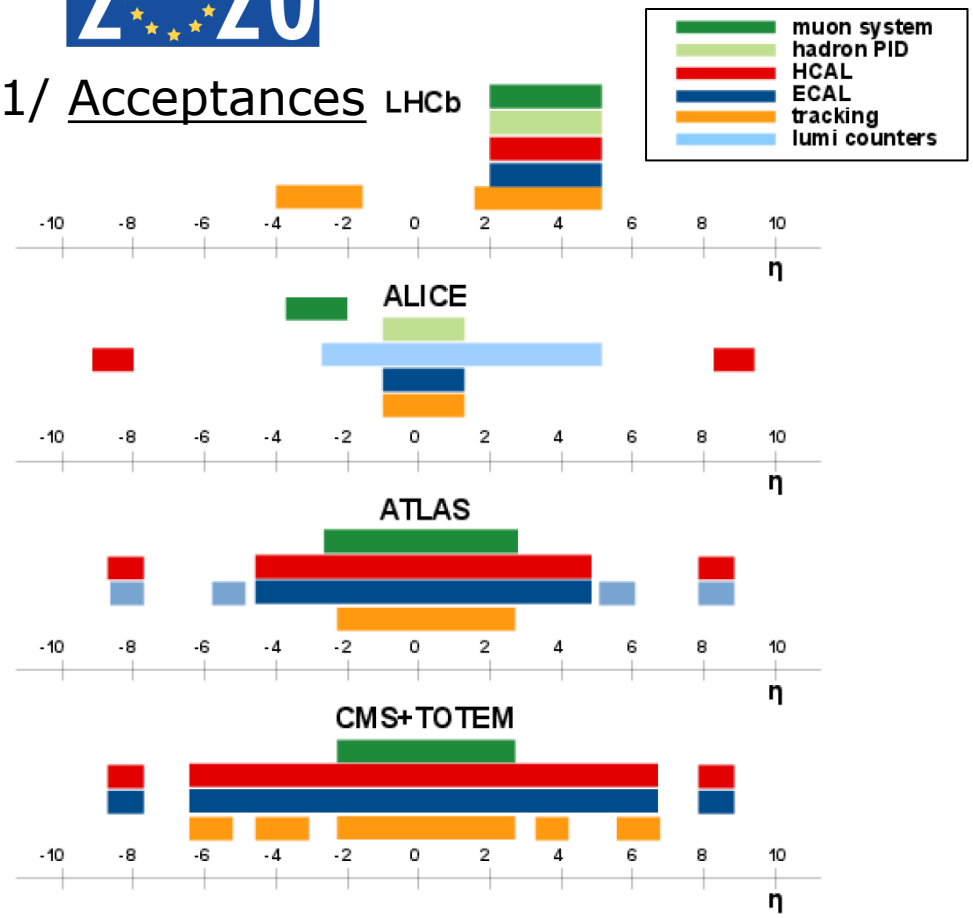
JRA1: Why combining?

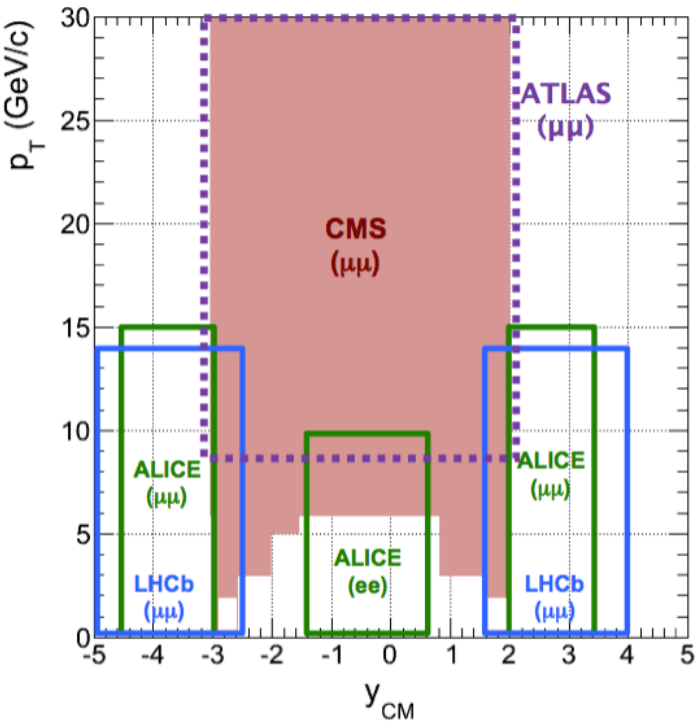
1/ Acceptances



3/ Bandwidth & triggering

Minimum bias or rare processes

Incl. pp collisions (and pile-up)



2/ Particle identification

Hadron PID in ALICE and LHCb

→ Concrete complementarity example

Published J/ψ coverage in pPb @ 5 TeV

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JRA1: Possible topics

- No limit a priori on the subjects of interest!
  - Look at all opportunities, see what we have at Quark Matter
- Usual suspects:
  - Constrain nuclear parton distribution functions
    - EW bosons at mid (ATLAS, CMS) and forward (ALICE, LHCb) rapidities…
  - Light-by-light scattering (3,7 + 4,4 sigmas = ?)
    - And other rare processes (top quarks…)
  - Open charm and beauty cross sections
    - Total and differential cross sections
  - Quarkonia (charm and bottom)
    - Balance between dissociation, recombination (low pt), energy loss (high pt)…
  - …
- Possible connections with:
  - NA-Jet-QGP, NA-Hf-QGP, NA-Small-x, NA-LatticeHadrons,
  - TA7-CERN, VA-NLOAccess, JRA-FTE@LHC, JRA-next-DIS
  - Others?

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JRA1: Current list of exp subscribers

Quarkonia
Heavy flavours
Soft/light (uds)
Jets / photons
Electroweak
Other

- ALICE: Anton Andronic (GSI), Roberta Arnaldi (Torino), Peter Braun-Munzinger (EMMI/GSI), Philippe Crochet (Clermont), Peter Jones (Birmingham), Christian Klein-Boesing (Muenster), Antonin Maire (Strasbourg), Gines Martinez (Nantes), Johanna Stachel (Heidelberg), Christophe Suire (Orsay), Alberto Baldisseri (CEA), Jaroslav Bielčik (Prague), Raphaël Tieulent (Lyon), Yves Schutz (Strasbourg)

+ L. Bianchi, J. Castillo, P. Christakoglou, M. Guilbaud, B. Hippolyte, S. Porteboeuf, F. Prino, E. Scomparin, M. Winn…

- ATLAS: Martin Spousta (Prague), Iwona Grabowska-Bold (Krakow), Adam Trzupek (Krakow)
- CMS: Raphaël GdC (LLR), Matthew Nguyen (LLR), Ferenc Siklér (Budapest)

+ D. d'Enterria (CERN)

- LHCb: Frédéric Fleuret (LLR/LAL), Giulia Manca (Cagliari), Michael Schmelling (Heidelberg), Patrick Koppenburg (NIKHEF)
- Theorists: François Arleo (LLR), Nestor Armesto (Santiago), Elena Bratkovskaya (Frankfurt), Magdalena Djordjevic (Belgrade), Elena Ferreiro (Santiago), Guilherme Milhano (LIP), Jean-Yves Ollitrault (Saclay) + J. Aichelin

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JRA1 : Deliverables and milestones

- Deliverables due for Reporting Period 1 (18 months, June 2019-November 2020): D19.1 and D19.2 are due M1 and M6 (November 2019)

Deliverable Number[14]	Deliverable Title	Lead beneficiary	Type[15]	Dissemination level[16]	Due Date (in months)[17]
D19.1	Vivid forum	1 - CNRS	Websites, patents filling, etc.	Confidential, only for members of the consortium (including the Commission Services)	1
D19.2	Road map	1 - CNRS	Report	Confidential, only for members of the consortium (including the Commission Services)	6

- MS32 has to be achieved M4

Milestone number[18]	Milestone title	Lead beneficiary	Due Date (in months)	Means of verification
MS32	Kick-off	1 - CNRS	4	The roadmap exists and the website is up and running

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JRA1 : Deliverables and milestones

- D19.1 ‘Vivid forum’ with a dedicated website with an agenda, list of meetings, archived talks, etc. This lively forum will evolve during the entire project, and even beyond.
  - Advancement: mailing list done
  - Expected delivery date: end of 2019

- MS32 (kick-off meeting) has to be achieved M4
  - Advancement: on hold,
  - Expected delivery date: post quark-matter, December?

- D19.2 ‘Road map’ after the kick-off meeting (MS1), a short document will list the possible topics of joint research on past data (run 1 and 2). Its release will follow shortly MS1
  - Advancement: on hold
  - Expected delivery date: Spring 2020

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JRA1 : Money share

- Mostly need dedicated manpower = At least one person per experiment feeling responsible for cross-experiment activities
  - At the postdoctoral level
  - Better if changing experiment (hence complemented to 3 years)
  - Better if stationed at CERN (to talk together, and with the collaborations)

- We'll see…
  - The treasure is currently at CNRS, in the Orsay-Saclay-Palaiseau area, where we have groups in the four experiments (though not in heavy-ion for Atlas)
    - 262 062 € for 54 months of young postdoc (3x12 + 18 for CMS)
    - 57 938 € for their travels

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