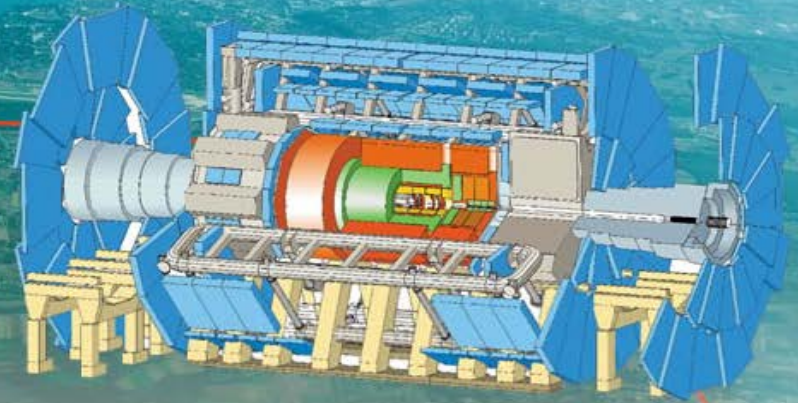


ATLAS FCPPL Projects session Introduction

Emmanuel MONNIER (CPPM)



FCPPL 11th workshop
Marseille 22th May 2018

11th France China Particle Physics
Laboratory Workshop

MAY 22-25, 2018 - MARSEILLE, FRANCE

Scientific Committee

BASTO Nicola (IFCC)
BOUDRY Vincent (LRI)
CABREJA Anatal (APC)
CAO Zheng (IHEP)
CHEN Gong (IHEP)
CHEN Guomin (IHEP)
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RUAN Wangji (IHEP)
WANG Meng (SDU)
YANG Chenglin (IHEP)

Local Committee
@CPPM

GARNIER Esthere
KAJASZ Eric
PEPE Angélique



21-May-18

E. Monnier - FCPPL 2018

First LHC Run2 2018 collision in ATLAS

FCPPL 2017 message

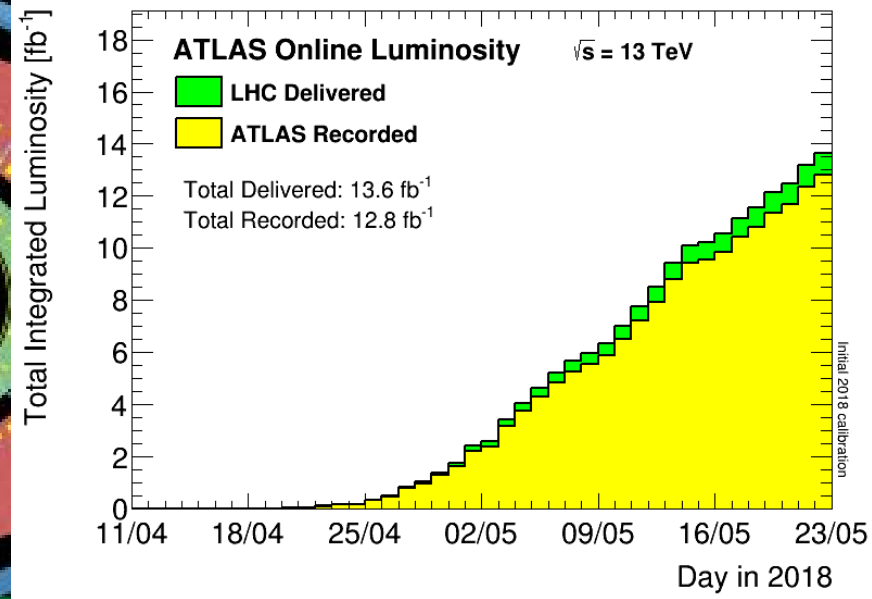
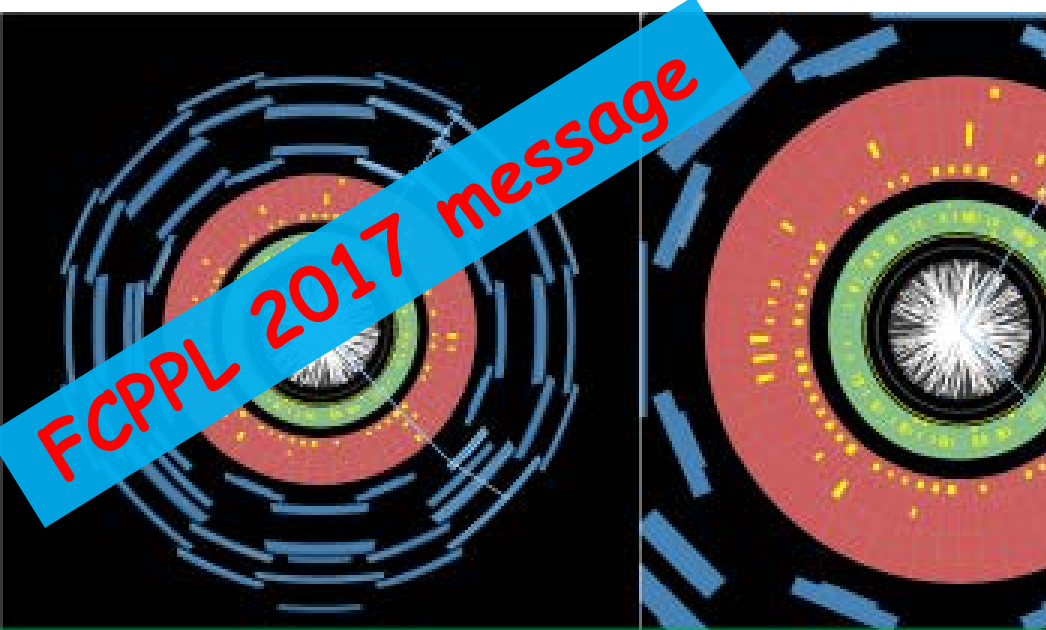
ATLAS will complete Run2 in 2018 !

New discovery expected

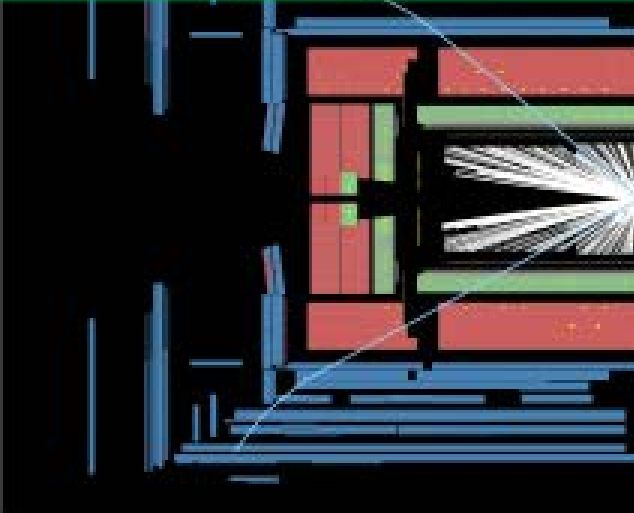


Run: 348197
Event: 921894
2018-04-17 13:08:51 CEST

First LHC Run2 2018 collision in ATLAS

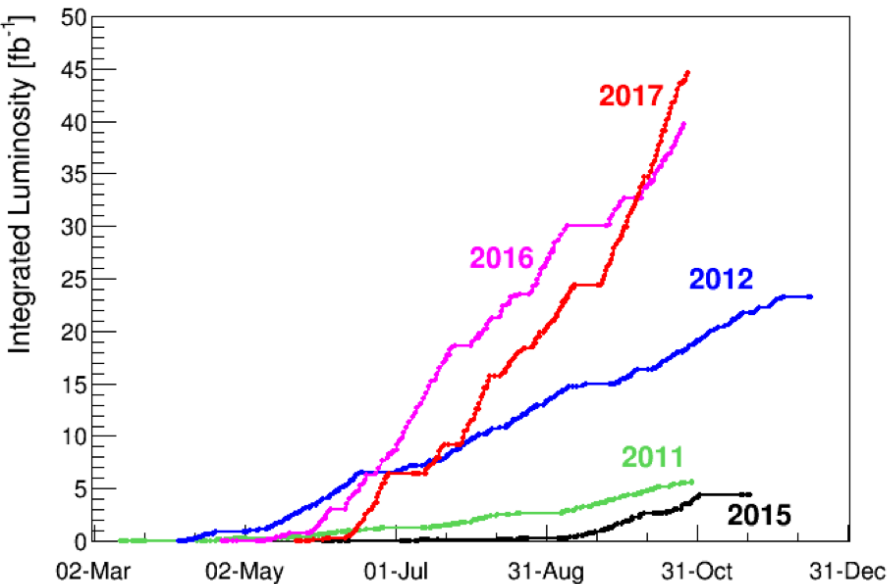


ATLAS will complete Run2 in 2018 !



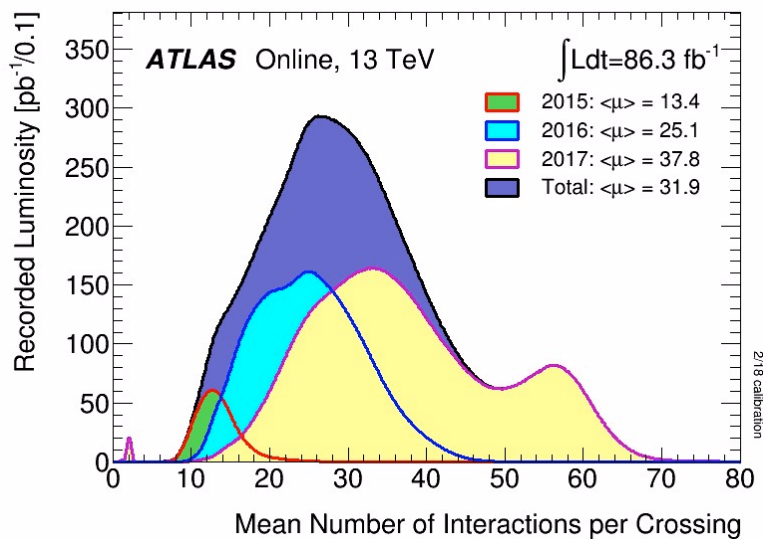
**road for legacy run2
results with precise
Higgs property studies
and new limits...**





Excellent Year 2017 !

Subdetector	Number of Channels	Approximate Operational Fraction
Pixels	92 M	97.8%
SCT Silicon Strips	6.3 M	98.7%
TRT Transition Radiation Tracker	350 k	97.2%
LAr EM Calorimeter	170 k	100 %
Tile Calorimeter	5200	99.2%
Hadronic End-Cap LAr Calorimeter	5600	99.5%
Forward LAr Calorimeter	3500	99.7%
LVL1 Calo Trigger	7160	99.9%
LVL1 Muon RPC Trigger	383 k	99.8%
LVL1 Muon TGC Trigger	320 k	99.9%
MDT Muon Drift Tubes	357 k	99.7%
CSC Cathode Strip Chambers	31 k	95.3%
RPC Barrel Muon Chambers	383 k	94.4%
TGC End-Cap Muon Chambers	320 k	99.5%
ALFA	10 k	99.9%
AFP	430 k	93.8%



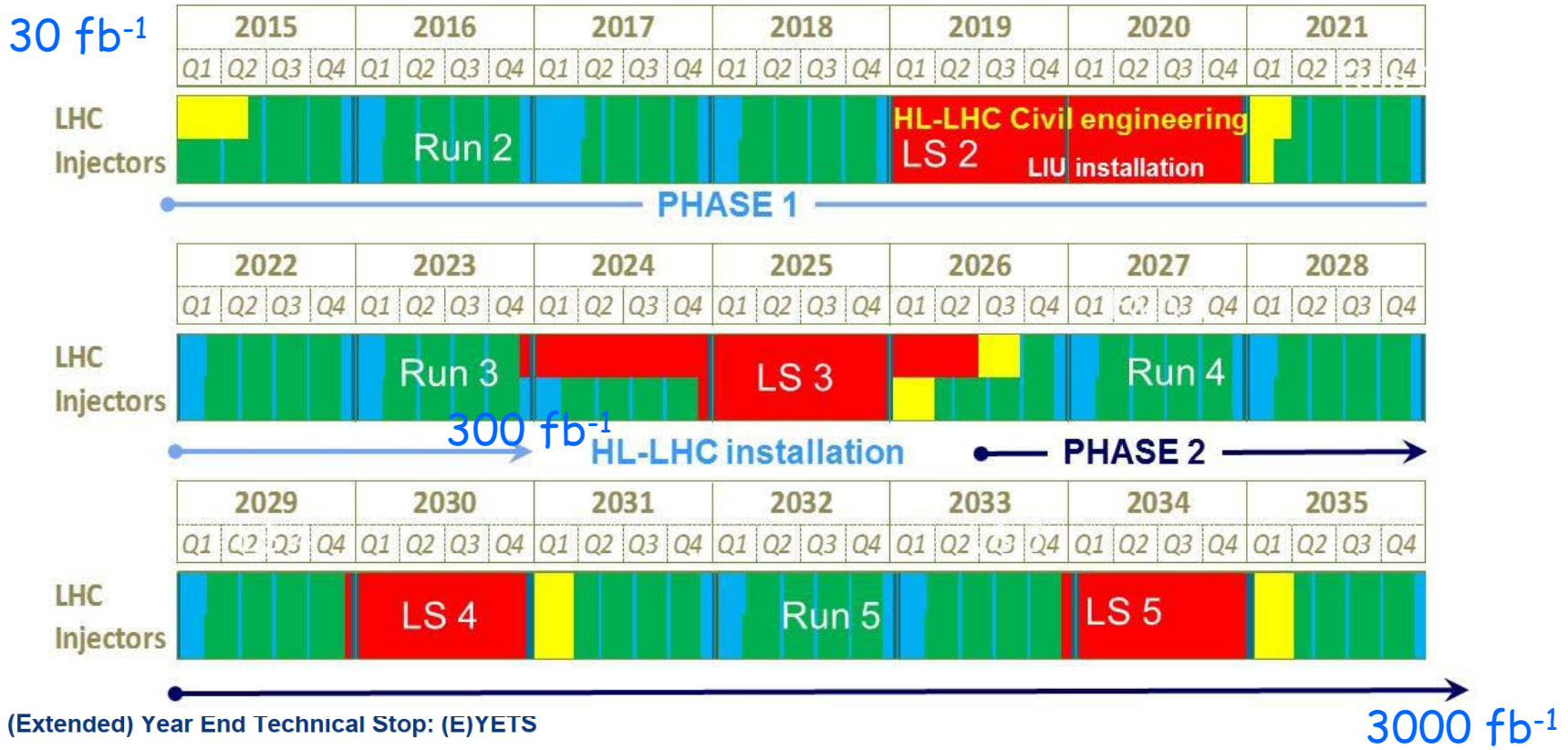
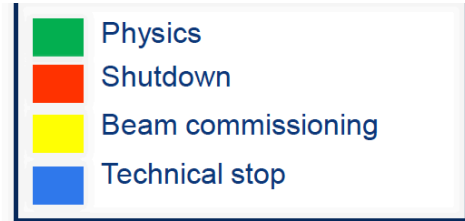
ATLAS pp 25ns run: June 5-November 10 2017

Inner Tracker			Calorimeters		Muon Spectrometer				Magnets	
Pixel	SCT	TRT	LAr	Tile	MDT	RPC	CSC	TGC	Solenoid	Toroid
100	99.9	99.3	99.5	99.4	99.9	97.8	99.9	100	100	99.2

Good for physics: 93.6% (43.8 fb⁻¹)

Luminosity weighted relative detector uptime and good data quality efficiencies (in %) during stable beam in pp collisions with 25ns bunch spacing at $\sqrt{s}=13$ TeV between June 5 – November 10 2017, corresponding to a delivered integrated luminosity of 50.4 fb⁻¹ and a recorded integrated luminosity of 46.8 fb⁻¹. The toroid magnet was off for some runs, leading to a loss of 0.5 fb⁻¹. Analyses that don't require the toroid magnet can use these data.

LS2 starting in 2019 => 24 months + 3 months BC
 LS3 LHC: starting in 2023 => 30 months + 3 months BC
 Injectors: in 2024 => 13 months + 3 months BC

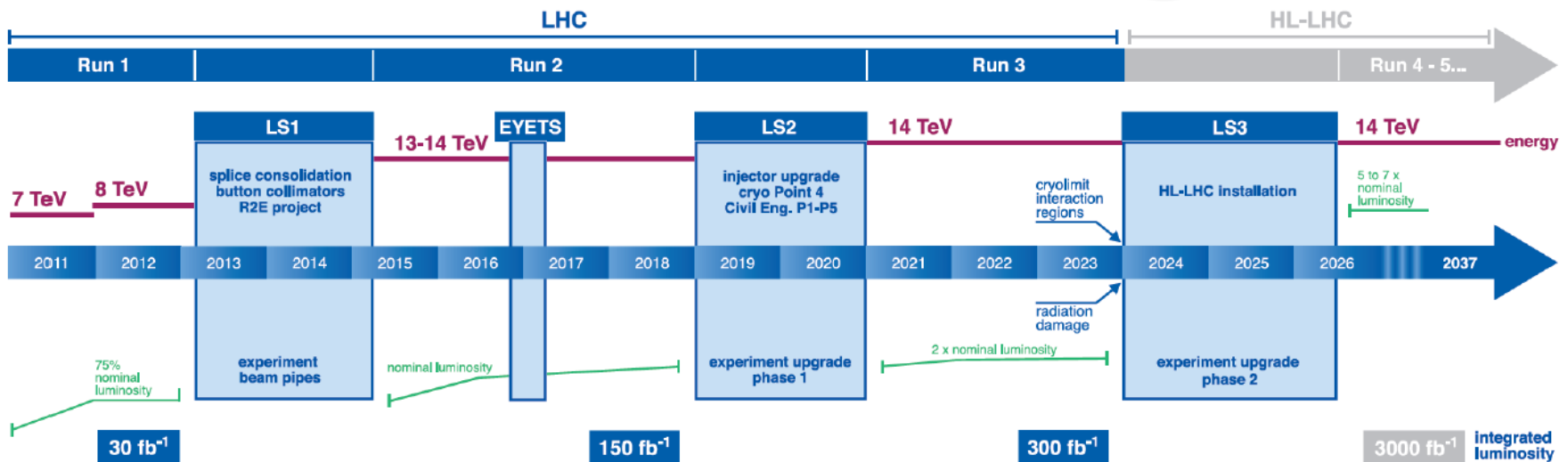


The High-Luminosity LHC (HL-LHC)

- Upgrade LHC luminosity to permit accumulation of 3 ab^{-1} data sample over a ~ 10 year run period following LS3 for machine and detector upgrades
- Plan for $\mathcal{L} = 5 \times 10^{34} \text{ cm}^{-2}\text{s}^{-1}$ with ultimate luminosity of $\mathcal{L} = 7.5 \times 10^{34} \text{ cm}^{-2}\text{s}^{-1}$

$\mu=140$

$\mu=200$



• ATLAS upgrades:

Long Shutdown 1 (LS1): RPC in barrel feet regions, MDT at $|\eta|$ in $[1.1, 1.3]$, pixel IBL, HLT

Long Shutdown 2 (LS2): New Small Wheel, muon, LAr electronics, L1 calo, FTK, TDAQ

Long Shutdown 3 (LS3): many new systems, R&D activities and TDR preparation ongoing

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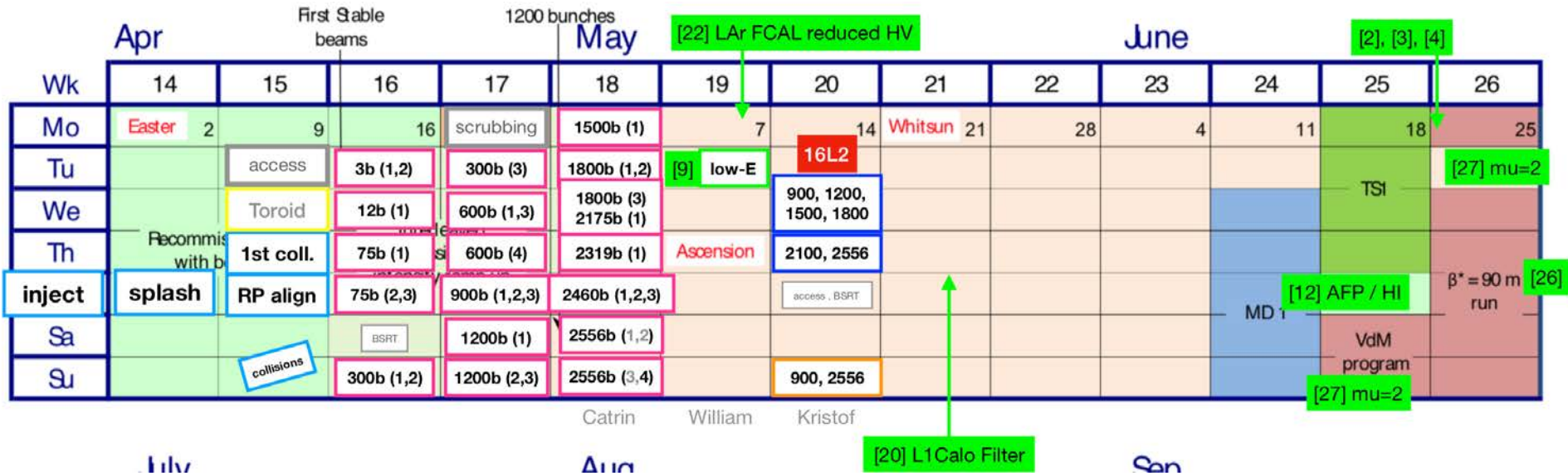
- Upgrade LHC luminosity to permit accumulation of 3 ab^{-1} data sample over a ~ 10 year run period following LS3 for machine and detector upgrades
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LHC & ATLAS 2018 start of run schedule 2018 very promising !

Expect Lumi up to 2.2×10^{34} and high pile up but with $O(150\text{fb}^{-1})$!



LHC & ATLAS 2018 start of run schedule 2018 very promising !

Expect Lumi up to 2.2×10^{34} and high pile up but with $O(150)$



FCPPL in 2017-2018: 2015+2016 data analysis
And inclusion of 2017 data set + approaching
upgrade Phase I installation
 (cf L. Ma Atlas upgrade talk and see following ones...)
 and a bit of upgrade (see M. Barero talk this morning)

LHC & ATLAS 2018 start of run schedule 2018 very promising !

Expect Lumi up to 2.2×10^{34} and high pile up but with $O(150\text{fb}^{-1})$!

Wk	Apr 14	Apr 15	Apr 16	Apr 17	May 18	May 19	May 20	May 21	May 22	May 23	May 24	May 25	May 26
Mo	Easter 2	9	16	scrubbing	1500b (1)	7	14	Whitsun 21	28	4	11	18	25
Tu		access	3b (1,2)	300b (3)	1800b (1,2)	[9] low-E	16L2					TSI	[27] mu=2
We		Toroid	12b (1)	600b (1,3)	1800b (3) 2175b (1)		900, 1200, 1500, 1800						
Th	Recommis with b	1st coll.	75b (1)	600b (4)	2319b (1)	Ascension	2100, 2556						
inject	splash	RP align	75b (2,3)	900b (1,2,3)	2460b (1,2,3)		access, BSRT					[12] AFP / HI	$\beta^* = 90 \text{ m}$ [26]
Sa			BSRT	1200b (1)	2556b (1,2)								
Su		collisions	300b (1,2)	1200b (2,3)	2556b (3,4)		900, 2556					VdM program	[27] mu=2

[22] LAr FCAL reduced HV
[2], [3], [4]

Catrin
William
Kristof

Many "Run 2" data (Higgs, Susy, SM analysis...) in which FCPPL cooperation is strongly contributing.

See today's talks as well as winter conference slides and related conf notes for details of ATLAS new results.

ATLAS Upgrade ramp up now in full swing. ATLAS FCPPL need to think on opportunities to further cooperate

- **Very strong cooperation program between the Atlas Chinese Cluster and CPPM, LAL, LPNHE since several years:**
 - Higgs, Susy studies, (through $\gamma\gamma$, WW final states and also lepton/jet/bjet/top final states such as in ttH, VH, H⁺⁺...)
(H. Ren PhD Def., C. Wang PhD Def., Z. Li, K. Liu, L. Ma, H. Xu talks)
 - Multi-boson studies (R. Zhang PhD Def.)
 - **Performance studies (E/gamma, B tag, Trigger, Calorimeter)**
 - Silicon detector R&D (M. Barbero Tuesday talk)
 - Numerous presentation in Atlas meetings, conferences as well as in internal, public/conf notes and publications.
 - Many senior physicists visits (France and China) with continuous cooperation work between ACC physicist and IN2P3 physicists
 - Several co-PhD thesis defended in 2017, H. Ren, C. Wang, R. Zhang, and more to come in 2018: Y. Zhao, C. Li... (Co-PhDs are an important strengthening force for the LIA)
- **Strong cooperation on WLCG, IHEP/IN2P3/CEA (L. Poggioli talk)**

ATLAS ACC-IN2P3 heavily involved in Run2 data analyses & performance studies in 2017-2018 aiming at 2015/16/17 publications.

● **Co-PhD :**

- Y. Zhao (LAL/SDU) SDU/LAL/Eiffel funded (started 09/14) defense summer 18
- C. Li (LPNHE/USTC) USTC/CSC funded (started 09/15)
- Y. Ma (LAL/SDU) SDU/CSC funded (started 09/15)
- H. Zhang (LAL/Nanjing) CSC funded (started 09/15)
- H. Ren (CPPM/IHEP) CAS/IHEP/FCPPL funded thesis defended fall 2017
- C. Wang (CPPM/SDU) CSC Cai Yuanpei funded thesis defended fall 2017
- R. Zhang (CPPM/USTC) CSC/USTC/FCPPL funded thesis defended fall 2017
- Z. Li (CPPM/SDU) CPPM/SDU funded (started 09/17)
- Y. Wang (LPNHE/USTC) USTC funded (started 09/17)
- H. Xu (CPPM/USTC) CPPM/USTC funded (started 09/17)

● **Many former Co-PhD students now postdoc or permanent positions**

● **SLHC Silicon detector R&D cooperation program ongoing,**

But need new PhD students & short stay scientists to strengthen it !

● **Need to strengthen manpower/funds for strong ATLAS Run 2 analysis and R&D for ATLAS upgrade and future detectors.**

谢谢!
 Merci!
 Thank
 You!

14:00	Highlights	CMS upgrade	<i>Huaqiao ZHANG</i>
		<i>Hôtel Mercure Centre Vieux-Port, Marseille</i>	14:00 - 14:25
		ATLAS upgrade	<i>Lianliang MA</i>
		<i>Hôtel Mercure Centre Vieux-Port, Marseille</i>	14:25 - 14:50
		ATLAS Projects Introduction	<i>Emmanuel MONNIER</i>
		<i>Hôtel Mercure Centre Vieux-Port, Marseille</i>	14:50 - 14:55
15:00		Search for VH -W> bb	<i>Kun LIU</i>
		<i>Hôtel Mercure Centre Vieux-Port, Marseille</i>	14:55 - 15:15
		Search for ttH in multilepton final states	<i>Zhi LI</i>
		<i>Hôtel Mercure Centre Vieux-Port, Marseille</i>	15:15 - 15:35
		Coffee Break	
		<i>Hôtel Mercure Centre Vieux-Port, Marseille</i>	15:35 - 16:05
16:00	ATLAS	Search for a High Mass Resonance with the WW Final State	<i>Lianliang MA</i>
		<i>Hôtel Mercure Centre Vieux-Port, Marseille</i>	16:05 - 16:25
		Search for doubly charged Higgs	<i>Hanlin XU</i>
		<i>Hôtel Mercure Centre Vieux-Port, Marseille</i>	16:25 - 16:45
17:00	LCG	WLCG project	<i>Luc POGGIOLI</i>
		<i>Hôtel Mercure Centre Vieux-Port, Marseille</i>	16:45 - 17:05
		CMS projects introduction	<i>Junquan TAO</i>
		<i>Hôtel Mercure Centre Vieux-Port, Marseille</i>	17:05 - 17:10
	CMS	Search for tth	<i>Nicolas CHANON</i>
		<i>Hôtel Mercure Centre Vieux-Port, Marseille</i>	17:10 - 17:24
		H -> gamma gamma	<i>Linda FINCO</i>
		<i>Hôtel Mercure Centre Vieux-Port, Marseille</i>	17:24 - 17:37
		Low mass gamma gamma resonances	<i>Sijing ZHANG</i>
		<i>Hôtel Mercure Centre Vieux-Port, Marseille</i>	17:37 - 17:50