

FCC RF Coordination Meeting

#16

#16

November 22, 2017



FCC Week 2018

FCCW 2018 – Key dates

20-Nov-2017	Abstract submission and registration open
08-Jan-2018	Abstract submission closed
18-Jan-2018	Notification of abstract acceptance
23-Mar-2017	Registration closed. No re-imburement of cancellation after this date
8-Apr-2017	Start of FCC Week
13-Apr-2017	End of FCC Week

Time	Sunday (8 APRIL)	Monday (9 APRIL)	Tuesday (10 APRIL)	Wednesday (11 APRIL)	Thursday (12 APRIL)	Friday (13 APRIL)	Time																	
	P1	Plenary	P1 P2 P3 P4	P1 P2 P3 P4 P5	P1 P2 P3 P4	Plenary																		
08:30-09:00	Registration (Place)	Opening, study status and physics perspectives	WELCOME (Name, Organisation)	FCC-hh ACC	Magnets	FCC-ee Phy/Exp	SRF	FCC-ee ACC	Magnets	FCC-hh Phy/Exp	FCC-hh ACC	/	FCC-hh Phy/Exp	FCC-ee ACC	I&O	STP	Summaries Machines and Technologies	Summary FCC-hh machine design	08:30-09:00					
09:00-09:30			Physics at FCC (Name, Org)	tbd	tbd	tbd	tbd	tbd	tbd	tbd	tbd	tbd	tbd	tbd	tbd	tbd		tbd	Summary FCC-ee machine design	09:00-09:30				
09:30-10:00		CHAIR (ORG)	Study status & further plans - M. Benedikt (CERN)	Coffee Break (Place)					Coffee Break (Place)					Coffee Break (Place)				CHAIR (ORG)	Summary Magnets / RF	10:00-10:30				
10:00-10:30		Registration (Place)	Coffee Break (Place)		FCC-hh ACC	Magnets	FCC-ee Phy/Exp	SRF	FCC-ee ACC	Magnets	FCC-hh Phy/Exp	FCC-hh ACC	/	FCC-hh Phy/Exp	FCC-ee ACC	Magnets	STP	Coffee Break		10:30-11:00				
10:30-11:00			Status Machines	FCC-hh conceptual machine design - CDR plan and status	tbd	tbd	tbd	tbd	tbd	tbd	tbd	tbd	tbd	tbd	tbd	tbd	tbd	tbd	Summaries Physics and Experiments	Summary FCC-he	11:00-11:30			
11:00-11:30				FCC-ee conceptual machine design - CDR plan and status	tbd	tbd	tbd	tbd	tbd	tbd	tbd	tbd	tbd	tbd	tbd	tbd	tbd	tbd		tbd	Summary FCC-hh experiments	11:30-12:00		
11:30-12:00			CHAIR (ORG)	HE-LHC CDR plan and status FCC-he CDR plan and status	Lunch (PLACE)					Lunch (PLACE)					Lunch (PLACE)					CHAIR (ORG)	Summary FCC-ee experiments	12:00-12:30		
12:00-12:30			Registration (Place)	Lunch (PLACE)		Lunch (PLACE)					Lunch (PLACE)					Lunch (PLACE)				CHAIR (ORG)	Closing remarks	12:30-13:00		
12:30-13:00				Lunch (PLACE)		FCC-hh ACC	Magnets	M. Mangano (CERN)	SRF	FCC-ee ACC	Magnets	FCC-hh Phy/Exp	STP	Economic impact of CERN colliders (1)	FCC-hh Phy/Exp	FCC-eh	I&O	STP	Free lunch break		13:00-13:30			
13:00-13:30				Status Technologies and Infrastructure	CE, I&O - CDR status and plan	tbd	tbd	tbd	tbd	tbd	tbd	tbd	tbd	tbd	tbd	M. Florio (Uni Milano)	tbd	tbd	tbd	tbd	CHAIR (ORG)	Closing remarks	13:30-14:00	
13:30-14:00					Special Technologies R&D - CDR plan and status	tbd	tbd	tbd	tbd	tbd	tbd	tbd	tbd	tbd	tbd	tbd	tbd	tbd	tbd	tbd			14:00-14:30	
14:00-14:30				CHAIR (ORG)	16 T Magnet R&D CDR plan and status SRF R&D CDR plan and status	Coffee Break (Place)					Coffee Break (Place)					Coffee Break (Place)				14:30-15:00				
14:30-15:00				Registration (Place)	Coffee Break (Place)		FCC-hh ACC	Magnets	M. Mangano (CERN)	SRF	FCC-ee ACC	Magnets	FCC-hh Phy/Exp	STP	Economic impact of CERN colliders (2)	HE LHC design	FCC-eh	Magnets	I&O	CHAIR (ORG)	Closing remarks	15:00-15:30		
15:00-15:30					Status Experiments and Detectors	FCC-hh experiments and detector - CDR plan and status	tbd	tbd	tbd	tbd	tbd	tbd	tbd	tbd	tbd	tbd	tbd	tbd	tbd			15:30-16:00		
15:30-16:00						FCC-ee experiments and detector - CDR plan and status	tbd	tbd	tbd	tbd	tbd	tbd	tbd	tbd	tbd	tbd	tbd	tbd	tbd			tbd	16:00-16:30	
16:00-16:30					CHAIR (ORG)	FCC-he CDR plan and status	Cold refreshments Place					Cold refreshments Place					Cold refreshments Place				16:30-17:00			
16:30-17:00					Registration (Place)	Cold refreshments Place		Cold refreshments Place					Cold refreshments Place					Cold refreshments Place				CHAIR (ORG)	Closing remarks	17:00-17:30
17:00-17:30						J. Gutleber (CERN)	Cold refreshments Place		Cold refreshments Place					Cold refreshments Place					Cold refreshments Place					17:30-18:00
17:30-18:00						Strategy Roadmaps Plenary Session	Global activities on future colliders and ICFA view - J. Lykken (FNAL)	EASITRAIN 8 x ESR Projects					FCC / EuroCirCol Collaboration Boards (closed session / Place)					EASITRAIN 7 x ESR Projects				Netherlands specific session	TITLE (Name, Org)	18:00-18:30
18:00-18:30	Procedure for the next European particle physics strategy update - F. Gianotti (CERN)						J. Gutleber (CERN)					L. Rivkin (PSI) / R. Aleksan (CEA)					J. Gutleber (CERN)				CHAIR (ORG)	TITLE (Name, Org)	18:30-19:00	
18:30-19:00	CHAIR (ORG)					CERN accelerator technology roadmap - F. Bordry (CERN)	J. Gutleber (CERN)					L. Rivkin (PSI) / R. Aleksan (CEA)					J. Gutleber (CERN)				CHAIR (ORG)	TITLE (Name, Org)	19:00-19:30	
19:00-19:30	Cold refreshments Place					Cold refreshments Place					Cold refreshments Place					Cold refreshments Place				19:30-20:00				

Participant list - preliminary

<u>BE/RF</u>
Arzeo, Matteo
Brunner, Olivier
Butterworth, Andy
Cai, Jinchi
Calaga, Rama
Chapochnikova, Elena
Grudiev, Alexej
Hofle, Wolfgang
Jensen, Erk
Karppinen, Mikko
Karpov, I
Komppula, Jani
Montesinos, Eric
Syratchev, Igor
Venturini, Walter

<u>EN/MME</u>
Atieh, Said
Bertinelli, Francesco
Capatina, Ofelia
Favre Gilles

<u>TE/VSC</u>
Calatroni, Sergio
Chiggiato, Paolo
Ilyina, Katsiaryna
Rosaz, Guillaume
Sublet, Alban
Taborelli, Mauro

D. Valuch

Carolina
Romain (STP)
Alexander?

Draft agenda:

3 sessions enough? (eventually transfer on session to STP)

Status talks:

- 1 talk LNL (Enzo?)
- 1-2 talks FNAL (collaboration on N-doping / CM design?)
 - 1-2 talks JLab
- 1-2 talk Rostock Univ (Shahnam + evt. HOM simulation tool?)
 - 1 talk Frankfurt Univ (if something done!)
 - 1 talk per FCC fellow (Marco, Carolina, Ivan, Jani)
 - 1 talk high efficiency klystron (Jinchi)
 - 1 talk FPC

Future program (i.e. for 2020 -> 2014):

- 1 talk per hot subject (Beam dynamics, LLRF, coating studies, etc)

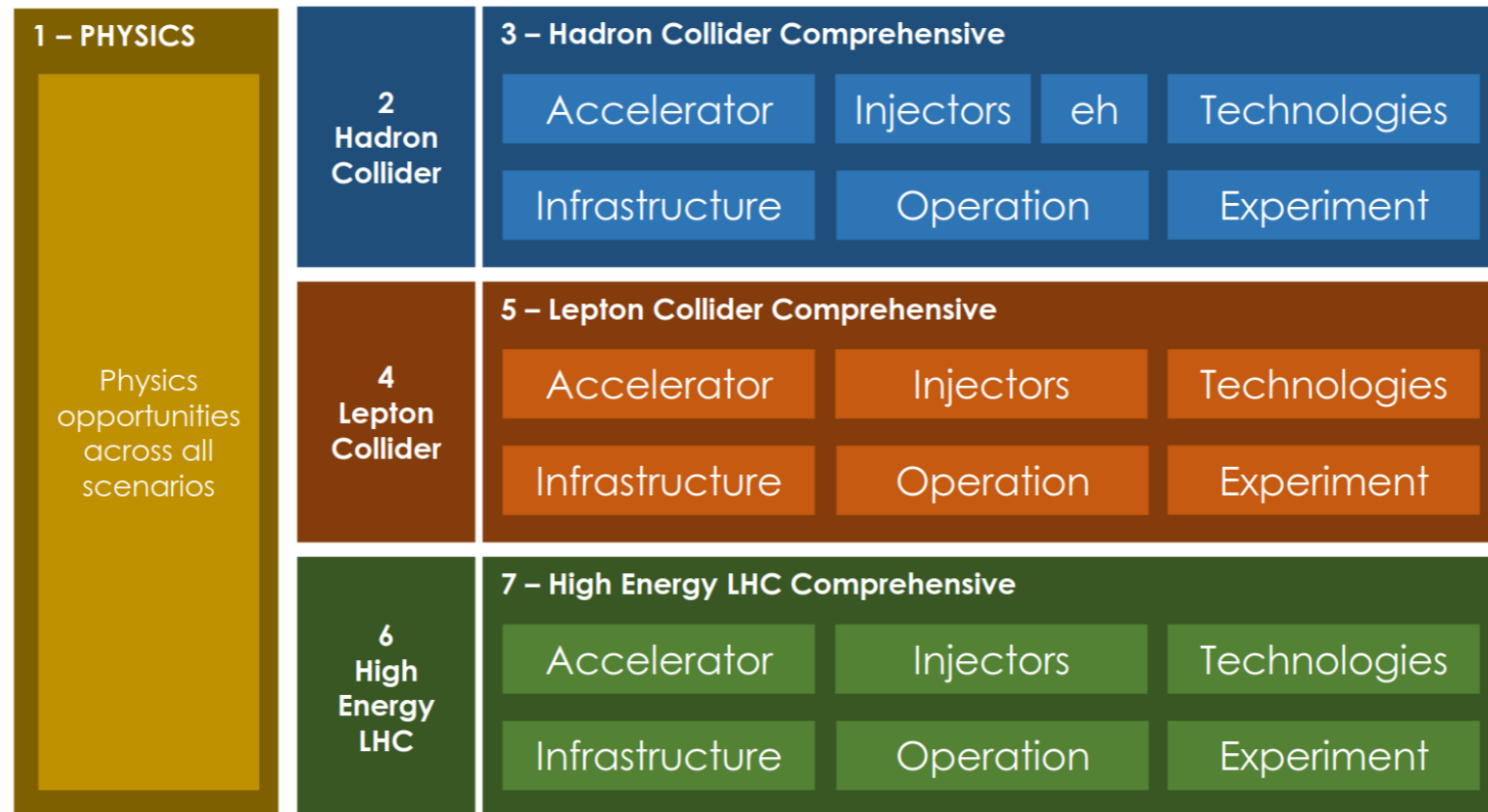
Please send comment/request/ideas!

FCC study 2020 - 2023

Name	Beam Dynamics Studies
Description	<i>Provide a detailed study of the beam dynamic challenges for FCC_ee and FCC_hh. Objectives: 1) validate the Z machine parameters 2) analyse and validate the bunch spacing options for FCC_hh 3) optimize cavity design for FCC_ee and FCC_hh 4) study of coupled bunch instabilities in both ee- and hh- machines 5) requirements for HOM damping in hh.6) requirements for LLRF</i>
Name	Cavity material and performance- Nb/Cu
Description	<i>Developememt of Nb/Cu thin SRF films on 1.3 GHz cavities. Objectives: 1) Optimize coating parameters with sample studies 2) Characterize RF impedance with QPR measuremnts 3) Coat 1.3 GHz monocells 4) coat 400 MHz monocells</i>
Name	Cavity material and performance- A15 materials
Description	<i>Developememt of A15 thin SRF films on 1.3 GHz cavities. Objectives: 1) Optimize coating parameters with sample studies 2) Characterize RF impedance with QPR measuremnts 3) Coat 1.3 GHz monocells 4) coat 400 MHz monocells</i>
Name	High efficiency power sources
Description	<i>Development of very high efficiency RF power sources. Objectives: 1) Optimize simulation code 2) train engineer on high efficiency klystron development 3) develop design for 800 MHz 4) develop design for 400 MHz 5) Develop a 400 MHz (or 800 MHz) demonstrator with an industry partner 6) qualify the demonstrator at CERN</i>
Name	Fundamental power couplers
Description	<i>Development of very high RF power couplers. Objectives: 1) identify dealbreakers and prepare roadmap 2) develop design for fix 400 MHz 1 MW couplers 3) develop design for movable 400 MHz power couplers 4) Develop demonstrators 5) test and validate the demonstrator at CERN 6</i>
Name	Superconducting cryomodules
Description	<i>Development of a new generation of LHC-like CM, in view of HE-LHC and FCC. Objectives: 1) develop a new design 2) create engineering folder 3) develop innovative cavity fabrication techniques 4) develop Nb additive manufacturing techniques for RF components (e.g. HOM couplers)</i>
Name	Feedback studies
Description	<i>Detailed study of the LLRF system requirement for HE-LHC, FCC_ee and FCC_hh. Objectives: 1) detail the LLRF system and technology for each machine 2) develop and built damper (kicker) demonstrator plus amplifier 3) develop LLRF for the dampers in uTCA technology</i>
Name	Innovative designs and developments
Description	<i>Develop innovative RF designs. Objectives: 1) complete qualification of Wide-Open_Crab Cavity (WOW CC). 2) develop CM design for WOWCC, 2) Built single cell RF quadrupole cavity , 3) qualify single cell RF quadrupole cavity performance.</i>

Please send comment/request/ideas!

CDR preparation



CDR FCC_hh

Chapter	Title	Editor	Number of pages
1	Physics Opportunities and Reach	Michelangelo Mangano	10
2	Collider Design and Performance	Daniel Schulte	25
3.2	Main magnet system	Davide Tommasini	8
3.3	Cryogenic Beam Vacuum system	Francis Perez	4
3.4	Radiofrequency System	Olivier Brunner	3
3.5	Beam Transfer system	Brennan Goddard	5
3.6	Collimation system	M.Capeans/M.Jimenez	2
3.7	Other system	M.Capeans/M.Jimenez	4
3.8	Radiation environment	Mar Capeans	2-3
4	Civil engineering	Volker Mertens	10
4.2	Layout and placement	J.Osborne/J.Stanyard	3
4.3	Underground structures	J.Osborne/J.Stanyard	4
4.4	Surface points	J.Osborne/J.Stanyard	3
5	Technical infrastructures	Volker Mertens	20
5.6	Cryogenic system	Laurent Tavian	4-5
6	Injector scenarios	Brennan Goddard	10
7	Experiments and detectors	Werner Riegler	20
8	Safety	Thomas Otto	5
9	Energy efficiency	Volker Mertens	3
10	Environment	Johannes Gutleber	4
11	Education, Economy and society	Johannes Gutleber	3
12	Strategic research and development	Michael Benedikt	10

Table 1: Table to show editor per chapter and number of pages

LHC CDR

5	Radio frequency and feedback systems	60
5.1	Basic parameters	60
5.2	The cavities	61
5.3	Power requirements	62
5.4	Longitudinal feedback system	63
5.5	Transverse dampers	64

1. Define table of content
2. Need input and contribution from Andy, Elena, Wolfgang, Philippe

CDR FCC_ee

Chapter	Title	Editor	Number of pages
1	Physics Discovery potential	Patrick Janot	20
2	Collider Design and Performance	Katsunobu Oide	25
3.1	Main RF system	Olivier Brunner	5
3.2	Main magnet system	Attilio Milanese	5
3.3	Vacuum system and e-cloud mitigation	Roberto Kersevan	4
3.4	Beam instrumentation and feedback System	Schmickler or Hofle	3
3.5	Beam dumping, beam injection and beam transfer system	Brennan Goddard	2
3.6	Other key technologies	M.Capeans/M.Jimenez	3
3.7	Radiation environment	Mar Capeans	2
4	Civil engineering	Volker Mertens	10
4.2	Layout and placement	J.Osborne/J.Stanyard	3
4.3	Underground structures	J.Osborne/J.Stanyard	4
4.4	Surface points	J.Osborne/J.Stanyard	3
5	Technical infrastructures	Volker Mertens	20
5.6	Cryogenic system	Laurent Tavian	3
6	Injector complex	Yannis Papaphilippou	10
7	Experiments and detectors	Patrick Janot	10
8	Safety	Thomas Otto	5
9	Energy efficiency	Volker Mertens	3
10	Environment	Johannes Gutleber	4
11	Education, Economy and society	Johannes Gutleber	3
12	Strategic research and development	Michael Benedikt	10

Table 1: Table to show editor per chapter and number of pages

1. Define table of content

- Introduction
- Operation model
- RF configuration
- Cavity material options (Walter)
- Beam cavity interaction/ beam dynamic issues (Andy, Ivan, Elena)
- Other R&D challenges (?)
- Installation and staging plan

??