

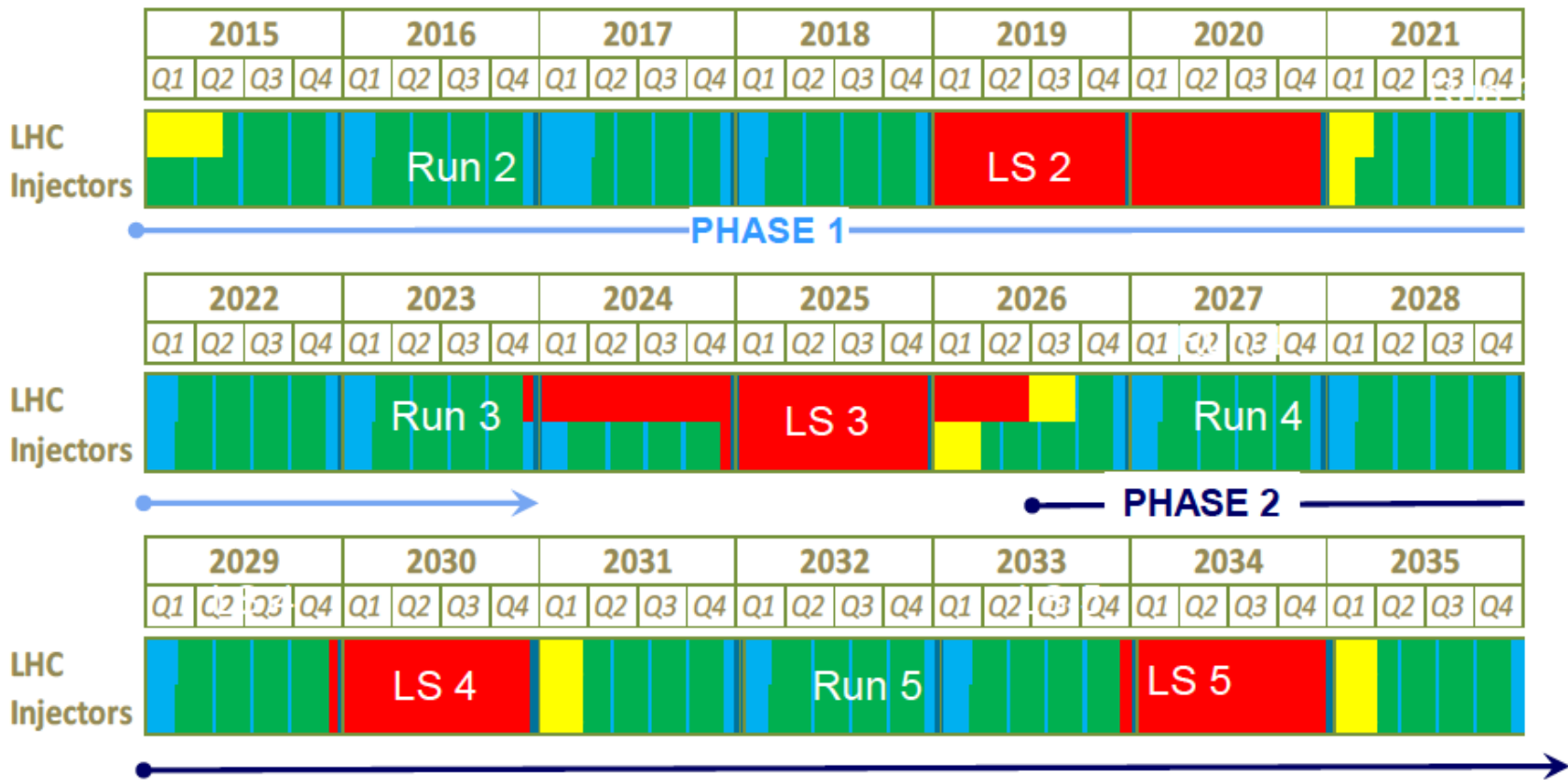


Workshop on Physics Program
of the **New QCD Facility at SPS (CERN)**
CERN 20/06/2018

Round Table(s)

LHC roadmap: according to MTP 2016-2020 V1

LS2 starting in 2019 => 24 months + 3 months BC
 LS3 LHC: starting in 2024 => 30 months + 3 months BC
 Injectors: in 2025 => 13 months + 3 months BC





Round tables



Questions to be discussed program by program

1. Readiness and feasibility
2. Competitors
3. Time constraints because of competitors

Program	Physics Goals	Beam Energy [GeV]	Beam Intensity [s^{-1}]	Trigger Rate [kHz]	Beam Type	Target	Earliest start time, duration	Hardware Additions
μp elastic scattering	Precision proton-radius measurement	100	$4 \cdot 10^6$	100	μ^\pm	high-pr. H2	2022 1 year	active TPC SciFi trigger silicon veto
Hard exclusive reactions	GPD E	160	10^7	10	μ^\pm	NH_3^\uparrow	2022 2 years	recoil silicon, modified PT magnet
Input for DMS	\bar{p} production cross-section	20-280	$5 \cdot 10^5$	25	p	LH2, LHe	2022 1 month	LHe target
\bar{p} -induced Spectroscopy	Heavy quark exotics	12, 20	$5 \cdot 10^7$	25	\bar{p}	LH2	2022 2 years	target spectr.: tracking, calorimetry
Drell-Yan	Pion PDFs	190	$7 \cdot 10^7$	25	π^\pm	C/W	2022 1-2 years	
Drell-Yan (RF)	Kaon PDFs Nucleon TMDs	~ 100	10^8	25-50	K^\pm, \bar{p}	NH_3^\uparrow , C/W	2026 2-3 years	"active absorber", vertex det.
Primakoff (RF)	Kaon polarizability & pion life time	~ 100	$5 \cdot 10^6$	> 10	K^-	Ni	n/e 2026 1 year	
Prompt Photons (RF)	Meson gluon PDFs	≥ 100	$5 \cdot 10^6$	10-100	K^\pm π^\pm	LH2, Ni	n/e 2026 1-2 years	hodoscope
K -induced Spectroscopy (RF)	High-precision strange-meson spectrum	50-100	$5 \cdot 10^6$	25	K^-	LH2	2026 1 year	recoil TOF forward PID
Vector mesons (RF)	Spin Density Matrix Elements	50-100	$5 \cdot 10^6$	10-100	K^\pm, π^\pm	from H to Pb	2026 1 year	

Table 5: Requirements for future programs at the M2 beam line after 2021. **Standard muon beams** are in blue, **standard hadron beams** in green, and **RF-separated hadron beams** in red.