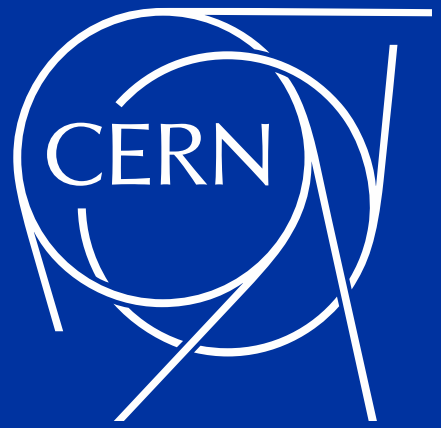



# Collimation Settings Strategy and Updated Loss Maps Matrix

Frederik Van der Veken *on behalf of the collimation team*

MPP #243 01/03/2024

# LHC Cycle in 2024

| | E [GeV] | Optics | ß* 1/5 [m] | ß* 2 [m] | ß* 8 [m] | X 1 [µrad] V | X 5 [µrad] H | X 2 [µrad] V | X 8 [µrad] H →V |
|---|---|---|---|---|---|---|---|---|---|
| **Injection** | 450 | 1 | 11 | 10 | 10 | 170 | 170 | 170 | -170 |
| **Ramp** | 450-6800 | 1-20 | 11 → 2 | 10 | 10 → 2 | 170 → 160 | 170 → 160 | 170 → 200 | -170 → -200 |
| **Flat Top** | 6800 | 20 | 2 | 10 | 2 | 160 | 160 | 200 | -200 |
| **Squeeze + LHCb Rotation** | 6800 | 20-22 | 2 → 1.2 | 10 | 2 | 160 | 160 | 200 | H: -200 → 0<br>V: 0 → 200 |
| **Tune Change** | 6800 | 22 | 1.2 | 10 | 2 | 160 | 160 | 200 | 200 |
| **Adjust** | 6800 | 22 | 1.2 | 10 | 2 | 160 | 160 | 200 | 200 |
| **Large Levelling** | 6800 | 23-34 | 1.2 → 0.6 | 10 | 2 | 160 | 160 | 200 | 200 |
| **Levelling** | 6800 | 34-43 | 0.6 → 0.3 | 10 | 2 | 160 | 160 | 200 | 200 |

**Optics in** `/afs/cern.ch/eng/lhc/optics/runIII/RunIII_dev/Proton_2024/` *(courtesy of S. Fartoukh)*

**Simulations in** `/eos/project-c/collimation-team/machine_configurations/LHC_run3/2024/`

# LHC Cycle in 2024

| | E [GeV] | Optics | ß* 1/5 [m] | ß* 2 [m] | ß* 8 [m] | X 1 [µrad] V | X 5 [µrad] H | X 2 [µrad] V | X 8 [µrad] H →V |
|---|---|---|---|---|---|---|---|---|---|
| **Injection** | 450 | 1 | 11 | 10 | 10 | +170 | 170 | 170 | -170 |
| **Ramp** | 450-6800 | 1-20 | 11 → 2 | 10 | 10 → 2 | 170 → 160 | 170 → 160 | 170 → 200 | -170 → -200 |
| **Flat Top** | 6800 | 20 | 2 | 10 | 2 | +160 | 160 | 200 | -200 |
| **Squeeze + LHCb Rotation** | 6800 | 20-22 | 2 → 1.2 | 10 | 2 | +160 | 160 | 200 | H: -200 → 0<br>V: 0 → 200 |
| **Tune Change** | 6800 | 22 | 1.2 | 10 | 2 | +160 | 160 | 200 | 200 |
| **Adjust** | 6800 | 22 | 1.2 | 10 | 2 | +160 | 160 | 200 | 200 |
| **Large Levelling** | 6800 | 23-34 | 1.2 → 0.6 | 10 | 2 | +160 | 160 | 200 | 200 |
| **Levelling** | 6800 | 34-43 | 0.6 → 0.3 | 10 | 2 | +160 | 160 | 200 | 200 |

**Optics in** `/afs/cern.ch/eng/lhc/optics/runIII/RunIII_dev/Proton_2024/` *(courtesy of S. Fartoukh)*

**Simulations in** `/eos/project-c/collimation-team/machine_configurations/LHC_run3/2024/`

# Collimator Settings

| | | IR7 [σ] | | | IR3 [σ] | | | Dump [σ] | | TCT [σ] | | | | TCL [σ] | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | TCP | TCSG | TCLA | TCP | TCSG | TCLA | TCDQ | TCSP | 1 | 2 | 5 | 8 | 4 | 5 | 6 |
| **Injection** | | 5.7 | 6.7 | 10 | 8 | 9.3 | 12 | 8 | 7.5 | 13 | 13 | 13 | 13 | - | - | - |
| **Ramp** | | ↓ | ↓ | 10 | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | - | - | - |
| **Flat Top** | | 5 | 6.5 | 10 | 15 | 18 | 20 | 7.3 | 7.3 | 18 | 37 | 18 | 18 | - | - | - |
| **Squeeze** | | 5 | 6.5 | 10 | 15 | 18 | 20 | 7.3 | 7.3 | ↓ | 37 | ↓ | ↓ | - | - | - |
| **Tune Change** | | 5 | 6.5 | 10 | 15 | 18 | 20 | 7.3 | 7.3 | 9.35 | 37 | 9.35 | 11.5 | - | - | - |
| **Adjust** | | 5 | 6.5 | 10 | 15 | 18 | 20 | 7.3 | 7.3 | 9.35 | 37 | 9.35 | 11.5 | - | - | - |
| **Levelling** | **120** | 5 | 6.5 | 10 | 15 | 18 | 20 | 7.3 | 7.3 | ↓ | 37 | ↓ | 11.5 | ↓ | ↓ | ↓ |
| | **60** | 5 | 6.5 | 10 | 15 | 18 | 20 | 7.3 | 7.3 | 8.5 | 37 | 8.5 | 11.5 | ↓ | ↓ | ↓ |
| | **30** | 5 | 6.5 | 10 | 15 | 18 | 20 | 7.3 | 7.3 | 8.5 | 37 | 8.5 | 11.5 | 17 | 42 | 30 |
| **XRP OUT** | | | | | | | | | | | | | | | 17 | |

# Collimator Settings

| | | IR7 [σ] | | | IR3 [σ] | | | Dump [σ] | | TCT [σ] | | | | TCL [σ] | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | TCP | TCSG | TCLA | TCP | TCSG | TCLA | TCDQ | TCSP | 1 | 2 | 5 | 8 | 4 | 5 | 6 |
| **Injection** | | 5.7 | 6.7 | 10 | 8 | 9.3 | 12 | 8 | 7.5 | 13 | 13 | 13 | 13 | - | - | - |
| **Ramp** | | ↓ | ↓ | 10 | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | - | - | - |
| **Flat Top** | | 5 | 6.5 | 10 | 15 | 18 | 20 | 7.3 | 7.3 | 18 | 37 | 18 | 18 | - | - | - |
| **Squeeze** | | 5 | 6.5 | 10 | 15 | 18 | 20 | 7.3 | 7.3 | ↓ | 37 | ↓ | ↓ | - | - | - |
| **Tune Change** | | 5 | 6.5 | 10 | 15 | 18 | 20 | 7.3 | 7.3 | 9.35 | 37 | 9.35 | 11.5 | - | - | - |
| **Adjust** | | 5 | 6.5 | 10 | 15 | 18 | 20 | 7.3 | 7.3 | 9.35 | 37 | 9.35 | 11.5 | - | - | - |
| **Levelling** | **120** | 5 | 6.5 | 10 | 15 | 18 | 20 | 7.3 | 7.3 | ↓ | 37 | ↓ | 11.5 | ↓ | ↓ | ↓ |
| | **60** | 5 | 6.5 | 10 | 15 | 18 | 20 | 7.3 | 7.3 | 8.5 | 37 | 8.5 | 11.5 | ↓ | ↓ | ↓ |
| | **30** | 5 | 6.5 | 10 | 15 | 18 | 20 | 7.3 | 7.3 | ***8.5**** | 37 | 8.5 | 11.5 | 17 | 42 | ***30**** |
| **XRP OUT** | | | | | | | | | | | | | | | 17 | |

**maybe not achievable*
***adapted settings for TCL6 in IP1*

# Collimation Settings: Open Points

- **TCL6 settings in IR1**
- **TCT at 8σ?**

# Collimation Settings: Open Points

- **TCL6 settings in IR1**
- **TCT at 8σ?**

- **Do we add another squeeze branch for ß* < 30cm?**
  - **TCDQ setting wrt TCT** (also if smaller TCT gap)
  - **WIRE implementation**

# TCL6 in IP1

- **Background for FASER** (left of IP1) **strongly influenced by TCL6 opening**
- **Several considerations to take into account** *(also dose in AFP experimental area)*
- **See e.g. *CollWG #277***

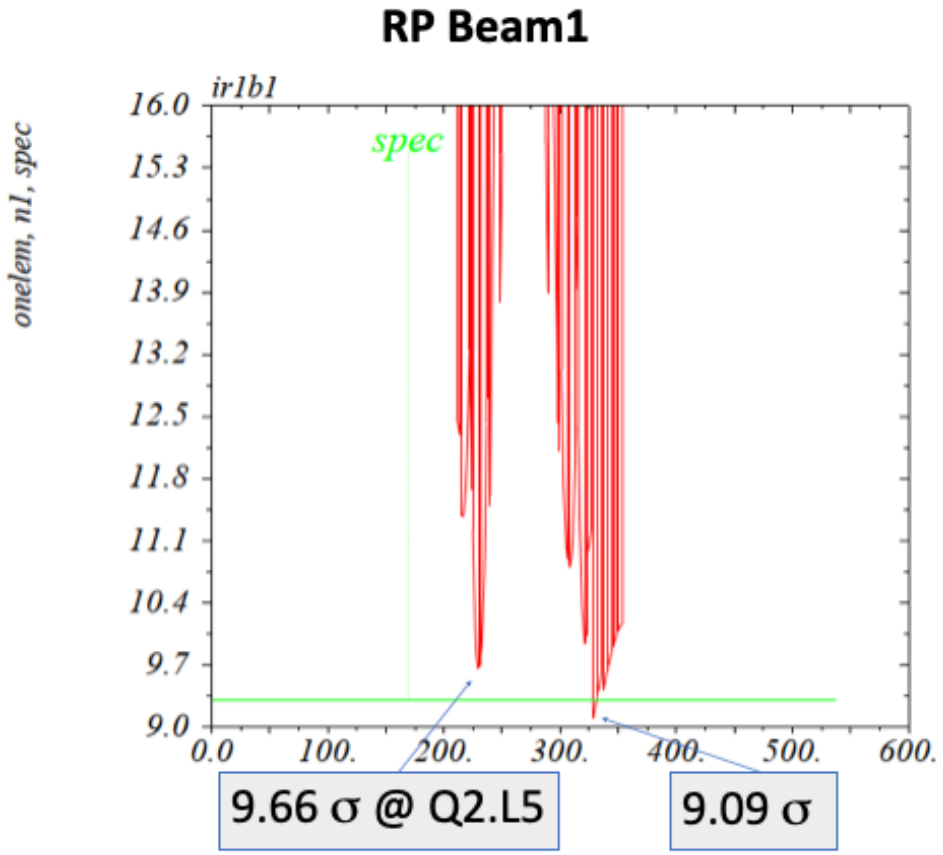
- **Proposal:**
  - **Commission at tightest gap possible (14.5σ)**
  - **This depends on start of ß*-levelling range:**
    1.62mm at ß*=120cm, 1.47mm at ß*=99cm, 1.43mm at ß*=93cm, 1.23mm at ß*=68cm
  - **If needed, adapt in function of measured FASER background:**
    - **Gap levelling**, or
    - **Relax minimum setting of 14.5σ** *(needs to be simulated and tested)*

# Aperture Bottleneck in D1.R1 (B1) and D1.L1(B2)

- **Aperture bottleneck with new RP optics in D1**
- **Bottleneck at 9σ ⇒ would need TCT at 8σ**

- **Proposal: keep tentatively at 8.5σ**

  **Adapt if issues during aperture measurement**
  *(request made to measure aperture indetail)*




*(courtesy of S. Fartoukh)*

# Loss Maps Matrix

- New optics! Need to perform all steps..
- Can do ~5 configurations in one fill
- Could we drop the XRP OUT LMs?

  The only difference is TCL5 closing, and it would save us a fill
- Will the WIREs be used at 30cm? This defines a potential extra loss map or not.

# Loss Maps Matrix

| | 450 GeV | | 6.8 TeV | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Injection | | Non colliding | | | Colliding XRP OUT | | | Colliding XRP IN | | | | | | | | | | | | | | | | | | | | WIRE |
| | | | | | | | | | Anti-telescopic | | | | | | | | | | | | | Telescopic | | | | | | | | |
| | Prot. IN | Prot. OUT | FT | EoS / EoR | QC | 120 cm | 60 cm | 30 cm | 120 cm | 112.5 cm | 105.5 cm | 99 cm | 93 cm | 87.5 cm | 82.5 cm | 77.5 cm | 72.5 cm | 68 cm | 64 cm | 60 cm | 56 cm | 52 cm | 48.5 cm | 45 cm | 41.5 cm | 38.5 cm | 35.5 cm | 32.5 cm | 30 cm | 30 cm |
| B1H | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| B1V | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| B2H | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| B2V | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| +dp/p | ✓ | ✓ | ✓ | | ✓ | | | | ✓ | | | | | | | | | | | ✓ | | | | | | | | | ✓ | ✓ |
| -dp/p | ✓ | ✓ | ✓ | | ✓ | | | | ✓ | | | | | | | | | | | ✓ | | | | | | | | | ✓ | ✓ |
| ASD | ✓ | ✓ | ✓ | | ✓ | | | (✓) | ✓ | | | | | | | | | | | ✓ | | | | | | | | | ✓ | ✓ |

# Loss Maps Matrix

| | 450 GeV | | 6.8 TeV | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Injection | | Non colliding | | | Colliding XRP OUT | | | Colliding XRP IN | | | | | | | | | | | | | | | | | | | | | | | WIRE |
| | | | | | | | | | Anti-telescopic | | | | | | | | | | | | | | | Telescopic | | | | | | | | |
| | Prot. IN | Prot. OUT | FT | EoS / EoR | QC | 120 cm | 60 cm | 30 cm | 120 cm | 112.5 cm | 105.5 cm | 99 cm | 93 cm | 87.5 cm | 82.5 cm | 77.5 cm | 72.5 cm | 68 cm | 64 cm | 60 cm | 56 cm | 52 cm | 48.5 cm | 45 cm | 41.5 cm | 38.5 cm | 35.5 cm | 32.5 cm | 30 cm | 30 cm |
| B1H | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| B1V | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| B2H | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| B2V | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| +dp/p | ✓ | ✓ | ✓ | | ✓ | | | | ✓ | | | | | | | | | | | ✓ | | | | | | | | | | ✓ | ✓ |
| -dp/p | ✓ | ✓ | ✓ | | ✓ | | | | ✓ | | | | | | | | | | | ✓ | | | | | | | | | | ✓ | ✓ |
| ASD | ✓ | ✓ | ✓ | | ✓ | | | (✓) | ✓ | | | | | | | | | | | ✓ | | | | | | | | | | ✓ | ✓ |

# Loss Maps Matrix

- **Need minimally 7+2 fills at top energy** (including XRP OUT and WIRE)
- **This is assuming that in one case we can do 6 steps in one fill (ß* = 112.5 - 82.5cm)**
- **If this doesn't work, it would even imply a 10th fill...**

- *Ps: need additional loss maps if ß* < 30cm in commissioning*

# Loss Maps Matrix

- **Need minimally 7+2 fills at top energy** (including XRP OUT and WIRE)
- **This is assuming that in one case we can do 6 steps in one fill (ß* = 112.5 - 82.5cm)**
- **If this doesn't work, it would even imply a 10th fill...**

- *Ps: need additional loss maps if ß* < 30cm in commissioning*

- **Proposal for alternative approach:**
  - **Focus on fills with ASD for first validation (5+2)**
  - **Perform missing points later,** or even only in case of need **(2)**

# Loss Maps Matrix: First Iteration

| | 450 GeV | | 6.8 TeV | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Injection | | Non colliding | | | Colliding XRP OUT | | | Colliding XRP IN | | | | | | | | | | | | | | | | | | | | WIRE |
| | | | | | | | | | Anti-telescopic | | | | | | | | | | | | | Telescopic | | | | | | | | |
| | Prot. IN | Prot. OUT | FT | EoS / EoR | QC | 120 cm | 60 cm | 30 cm | 120 cm | 112.5 cm | 105.5 cm | 99 cm | 93 cm | 87.5 cm | 82.5 cm | 77.5 cm | 72.5 cm | 68 cm | 64 cm | 60 cm | 56 cm | 52 cm | 48.5 cm | 45 cm | 41.5 cm | 38.5 cm | 35.5 cm | 32.5 cm | 30 cm | 30 cm |
| B1H | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | | ✓ | | ✓ | | ✓ | | | ✓ | | ✓ | | ✓ | | | ✓ | | ✓ | ✓ |
| B1V | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | | ✓ | | ✓ | | ✓ | | | ✓ | | ✓ | | ✓ | | | ✓ | | ✓ | ✓ |
| B2H | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | | ✓ | | ✓ | | ✓ | | | ✓ | | ✓ | | ✓ | | | ✓ | | ✓ | ✓ |
| B2V | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | | ✓ | | ✓ | | ✓ | | | ✓ | | ✓ | | ✓ | | | ✓ | | ✓ | ✓ |
| +dp/p | ✓ | ✓ | ✓ | | ✓ | | | | ✓ | | | | | | | | | | | ✓ | | | | | | | | | ✓ | ✓ |
| -dp/p | ✓ | ✓ | ✓ | | ✓ | | | | ✓ | | | | | | | | | | | ✓ | | | | | | | | | ✓ | ✓ |
| ASD | ✓ | ✓ | ✓ | | ✓ | | | (✓) | ✓ | | | | | | | | | | | ✓ | | | | | | | | | ✓ | ✓ |

# Loss Maps Matrix: First Iteration

| | 450 GeV | | 6.8 TeV | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Injection | | Non colliding | | | Colliding XRP OUT | | | Colliding XRP IN | | | | | | | | | | | | | | | | | | | | | | WIRE |
| | | | | | | | | | Anti-telescopic | | | | | | | | | | | | | | Telescopic | | | | | | | | |
| | Prot. IN | Prot. OUT | FT | EoS / EoR | QC | 120 cm | 60 cm | 30 cm | 120 cm | 112.5 cm | 105.5 cm | 99 cm | 93 cm | 87.5 cm | 82.5 cm | 77.5 cm | 72.5 cm | 68 cm | 64 cm | 60 cm | 56 cm | 52 cm | 48.5 cm | 45 cm | 41.5 cm | 38.5 cm | 35.5 cm | 32.5 cm | 30 cm | 30 cm |
| B1H | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | | ✓ | | ✓ | | ✓ | | | ✓ | | ✓ | | ✓ | | | ✓ | | ✓ | ✓ |
| B1V | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | | ✓ | | ✓ | | ✓ | | | ✓ | | ✓ | | ✓ | | | ✓ | | ✓ | ✓ |
| B2H | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | | ✓ | | ✓ | | ✓ | | | ✓ | | ✓ | | ✓ | | | ✓ | | ✓ | ✓ |
| B2V | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | | ✓ | | ✓ | | ✓ | | | ✓ | | ✓ | | ✓ | | | ✓ | | ✓ | ✓ |
| +dp/p | ✓ | ✓ | ✓ | | ✓ | | | | ✓ | | | | | | | | | | | ✓ | | | | | | | | | ✓ | ✓ |
| -dp/p | ✓ | ✓ | ✓ | | ✓ | | | | ✓ | | | | | | | | | | | ✓ | | | | | | | | | ✓ | ✓ |
| ASD | ✓ | ✓ | ✓ | | ✓ | | | (✓) | ✓ | | | | | | | | | | | ✓ | | | | | | | | | ✓ | ✓ |

# Loss Maps Matrix: Second Iteration

| | 450 GeV | | 6.8 TeV | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Injection | | Non colliding | | | Colliding XRP OUT | | | Colliding XRP IN | | | | | | | | | | | | | | | | | | | | WIRE |
| | | | | | | | | | Anti-telescopic | | | | | | | | | | | | | Telescopic | | | | | | | | |
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| B1H | | | | | | | | | | ✓ | | ✓ | | ✓ | | ✓ | | ✓ | ✓ | | ✓ | | ✓ | | ✓ | ✓ | | ✓ | | |
| B1V | | | | | | | | | | ✓ | | ✓ | | ✓ | | ✓ | | ✓ | ✓ | | ✓ | | ✓ | | ✓ | ✓ | | ✓ | | |
| B2H | | | | | | | | | | ✓ | | ✓ | | ✓ | | ✓ | | ✓ | ✓ | | ✓ | | ✓ | | ✓ | ✓ | | ✓ | | |
| B2V | | | | | | | | | | ✓ | | ✓ | | ✓ | | ✓ | | ✓ | ✓ | | ✓ | | ✓ | | ✓ | ✓ | | ✓ | | |
| +dp/p | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| -dp/p | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ASD | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

# Loss Maps Matrix: Second Iteration

| | 450 GeV | | 6.8 TeV | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Injection | | Non colliding | | | Colliding XRP OUT | | | Colliding XRP IN | | | | | | | | | | | | | | | | | | | | | | WIRE |
| | | | | | | | | | Anti-telescopic | | | | | | | | | | | | | Telescopic | | | | | | | | |
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| B1H | | | | | | | | | | ✓ | | ✓ | | ✓ | | ✓ | | ✓ | ✓ | | ✓ | | ✓ | | ✓ | ✓ | | ✓ | | |
| B1V | | | | | | | | | | ✓ | | ✓ | | ✓ | | ✓ | | ✓ | ✓ | | ✓ | | ✓ | | ✓ | ✓ | | ✓ | | |
| B2H | | | | | | | | | | ✓ | | ✓ | | ✓ | | ✓ | | ✓ | ✓ | | ✓ | | ✓ | | ✓ | ✓ | | ✓ | | |
| B2V | | | | | | | | | | ✓ | | ✓ | | ✓ | | ✓ | | ✓ | ✓ | | ✓ | | ✓ | | ✓ | ✓ | | ✓ | | |
| +dp/p | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| -dp/p | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ASD | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

# Conclusions

- A few open points on settings (TCL6 and TCT)
- Loss maps matrix:
  - Do we really need 9 fills for loss maps?
  - Can we choose an alternative approach?
  - Can we drop XRP OUT?
- Exciting times coming our way - looking forward to seeing each other again in the CCC!

**Thanks for your attention!**


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