

Overview of ATLAS forward proton detectors for LHC Run 3 and plans for the HL-LHC

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on behalf of ATLAS Forward Detectors

AFP aims to measure events in which **one or both protons** remain **intact** after interaction. This is possible due to colourless exchange.

Four Roman pot stations, two on each side of ATLAS. All contain **tracking detectors** (6/30 μm resolution in x/y), Far stations consist **Time-of-Flight** (20 ps).

Detectors were installed and took data during LHC Run 2.

Improvements for Run 3 operation:

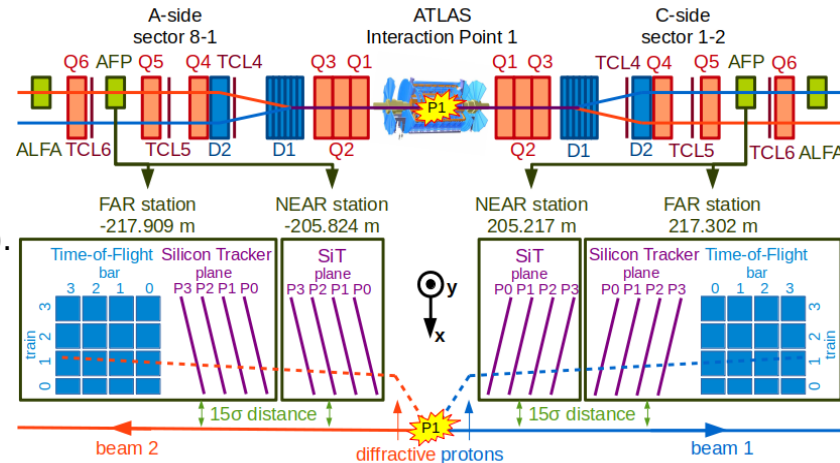
- New design of detector flange: Out-of-Vacuum solution for ToF detectors.
- New SiT modules to replace used ones.
- Trigger module: possibility to trigger on a single ToF train.
- New photo-multipliers: address inefficiency issues from Run2 data-taking.

Detectors are commissioned with the first LHC beams and **waiting for Run 3 physics data!**

Run 3 plans: participate in all standard, high pile-up (μ) fills as well as in dedicated low- μ runs.

For **Run 4** Roman pots may improve capability to measure/search for photon induced/BSM processes:

- Ongoing discussion in ATLAS.
- Significant constraints in LHC tunnel wrt. Run3 \rightarrow only few locations possible for pots.
- Location of pots determines accessible mass range.
- Having more stations located at various locations would cost more, but would improve overall detector acceptance.



HL-LHC Roman Pots at IP1

