Overview of ATLAS forward proton detectors for LHC Run 3 and plans for the HL-LHC
Maciej Trzebiński (Institute of Nuclear Physics Polish Academy of Sciences)
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 → 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.