Injector monitoring status and specification plans

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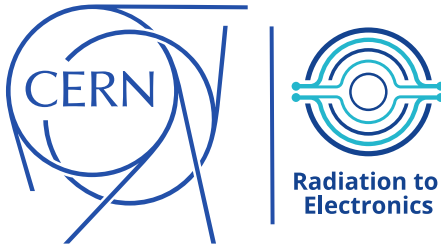
On behalf of the Monitoring and Calculation Working Group (MCWG)

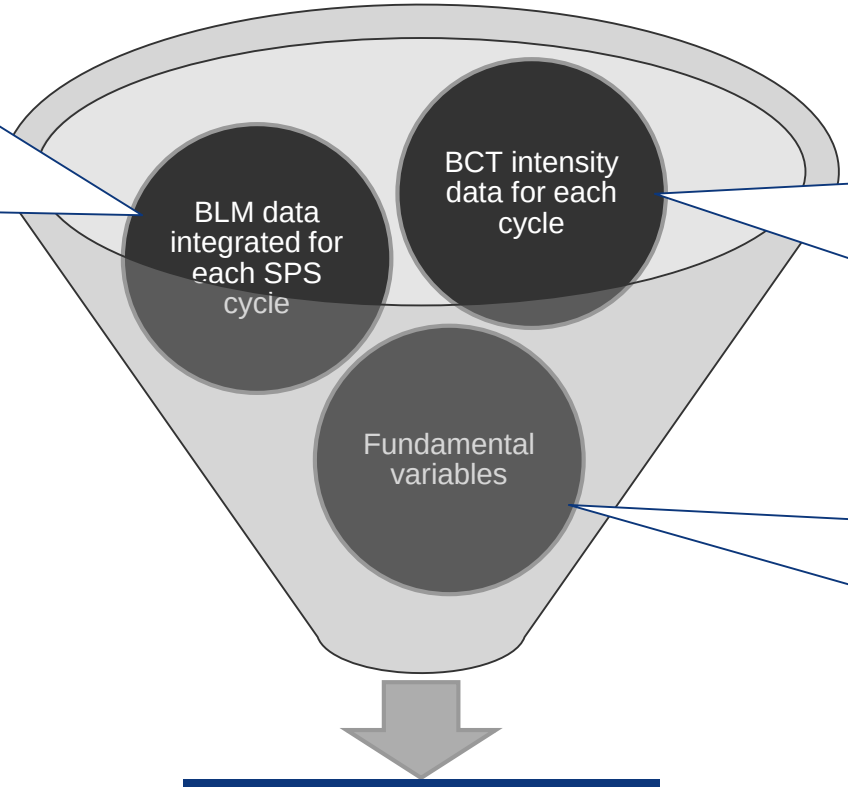


Injector Monitoring status (1)

- ***SPS***:
  - **BLM** (~270 units) data sometimes doubtful for dosimetry purpose,
    - Logging does not allow data processing as for the LHC BLMs (SPS BLM dose rate integrated over cycle),
    - New methodology of BLM data analysis (next slide),
    - Similar approach for SPS transfer lines,
    - Automation (in progress),
    - Online monitoring (in the future),
  - Automation of **RadMon** (~60 units) data analysis (in progress),
  - BatMons (~ 200 units)
  - **Distributed Optical Fibre Radiation and Temperature Sensing in the SPS Ring and TT20** after LS2 (EDMS **1969746**).

Scheme of SPS BLM data processing

BLM data from CALS:
- detect **problems with logging**,
- detect potential **saturation**,
- check how much **negative readout** decreases TID



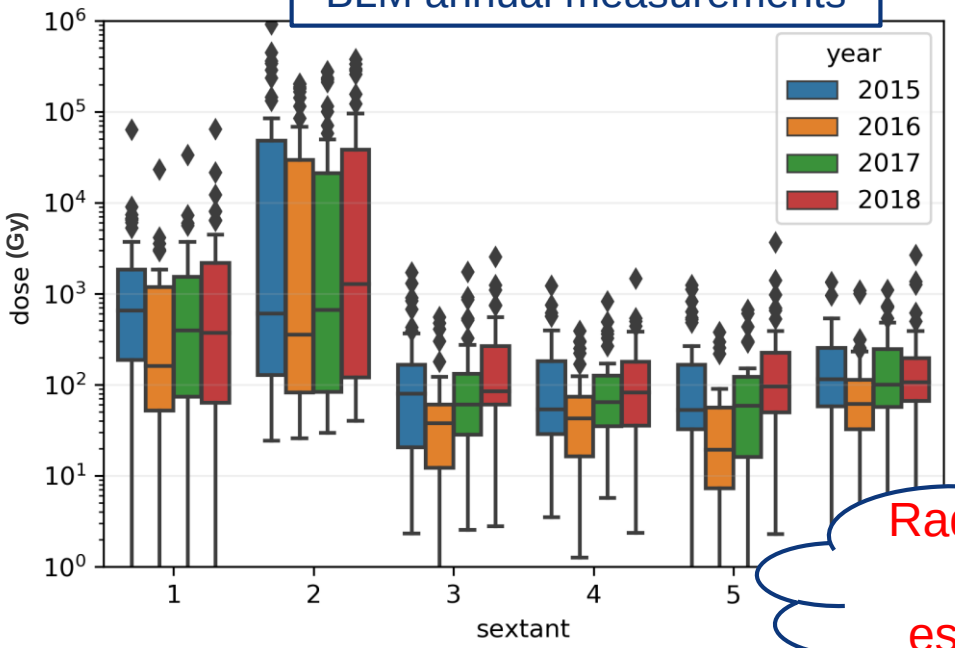
- **Exclude SPS cycles without beam** in the machine → **reduce noise** and contribution of negative readout,
- **Normalization of BLM data** (with either injected or integrated intensity)

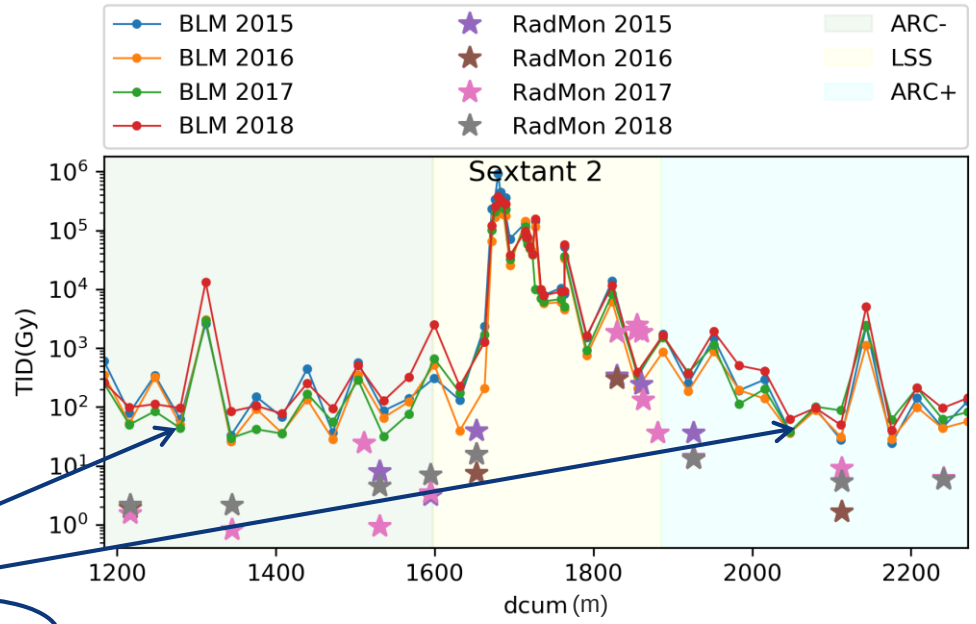
Information about:
- Beam **User** (North Area,…),
- Beam **Destination** (FTARGET,…),
- **Particle** Type (Proton, PB82,…)

Automated SPS BLM data analysis

SPS radiation analysis: examples

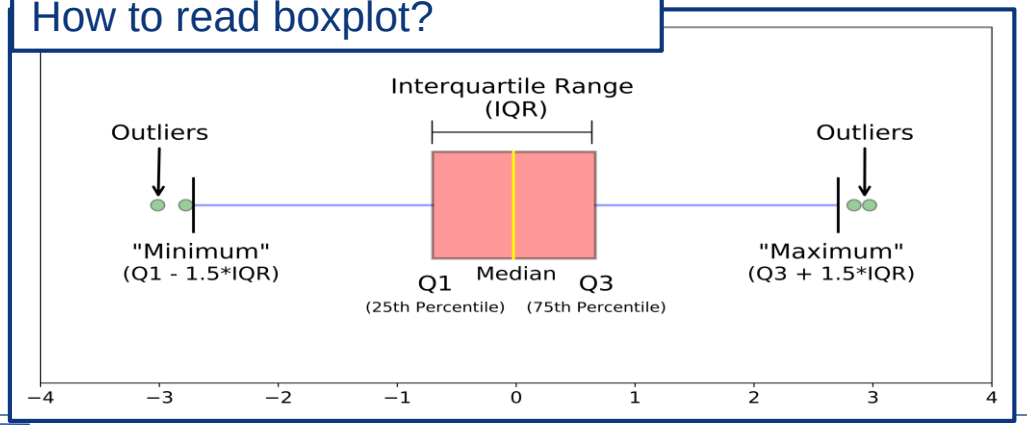
BLM annual measurements



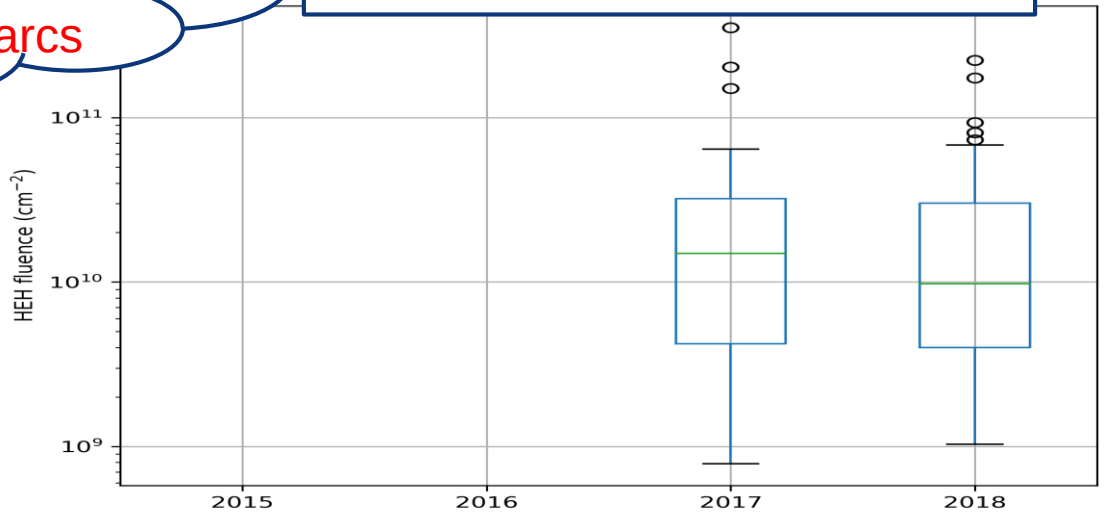


Radiation levels higher wrt the LHC, especially in the arcs

How to read boxplot?



RadMon annual HEH fluence



Injector Monitoring status (2)

- ***PS***:
  - BLMs (**no automated MCWG analysis yet),**
  - RadMons (16 units),
  - Distributed Optical Fibre Radiation Sensing (DOFRS, since 2018, EDMS **1843997**),

- ***PSB***:
  - BLMs (**no automated MCWG analysis yet)**,
  - RadMons (8 units),
  - RadFet (40 units),
  - **DOFRS (since 2017),**

Monitoring & Specification plans

- Automation of the analysis from available and reliable radiation monitors,
- Report on Run 2 radiation levels in the SPS with HL-LHC predictions, mainly based on BLM and active RadMon measurements.
- Comprehensive **monitoring** → injectors **specification**… (?)

In view of The LHC Injectors Upgrade (LIU) how the specification for the injectors should look like?

Thank you for your attention!