

Update on the Soft X-ray GEM diagnostic

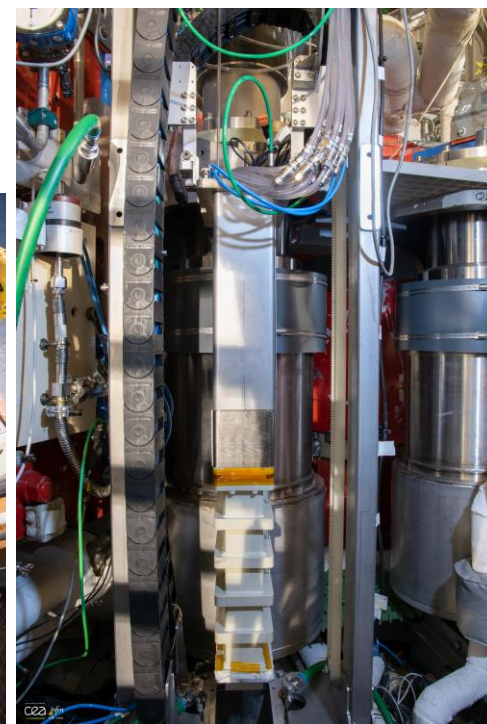
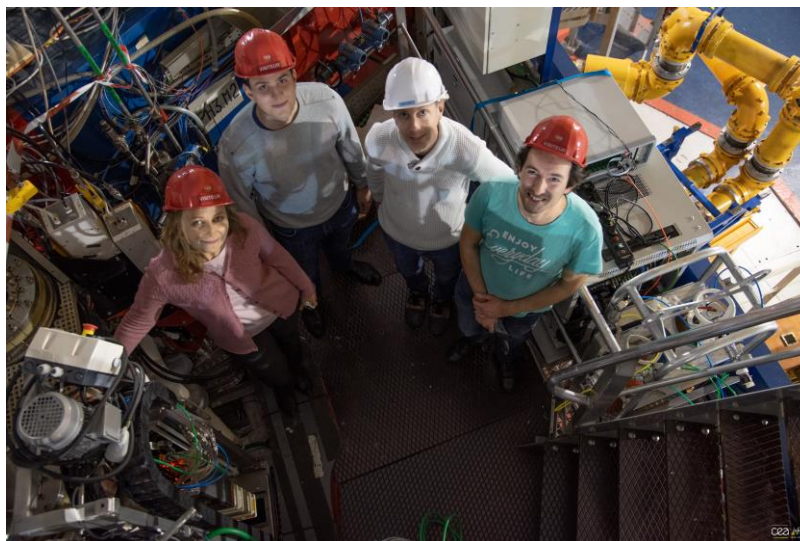
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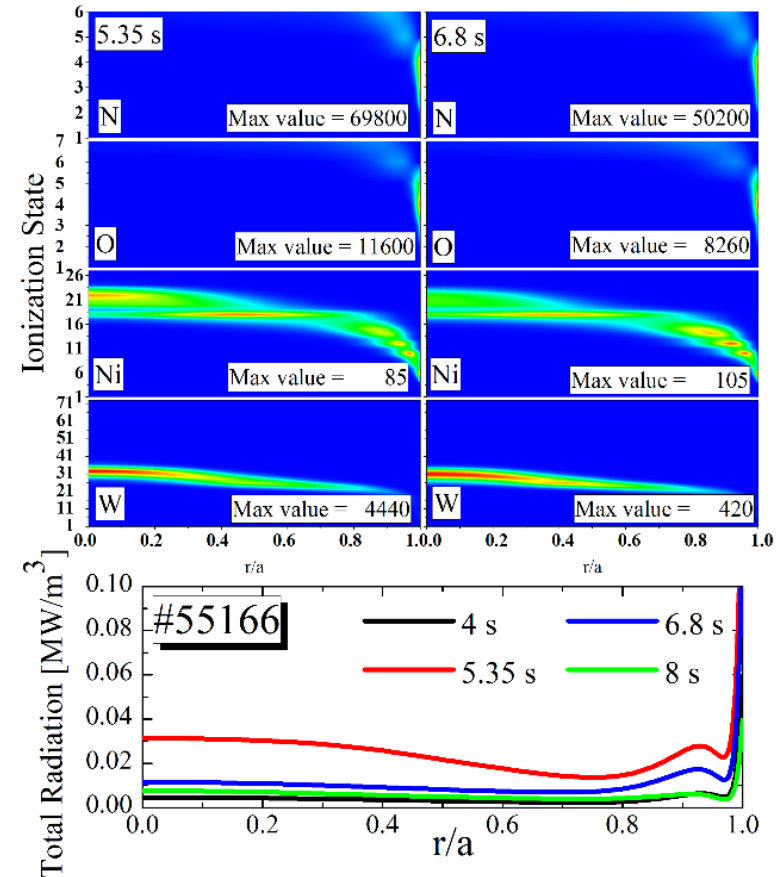
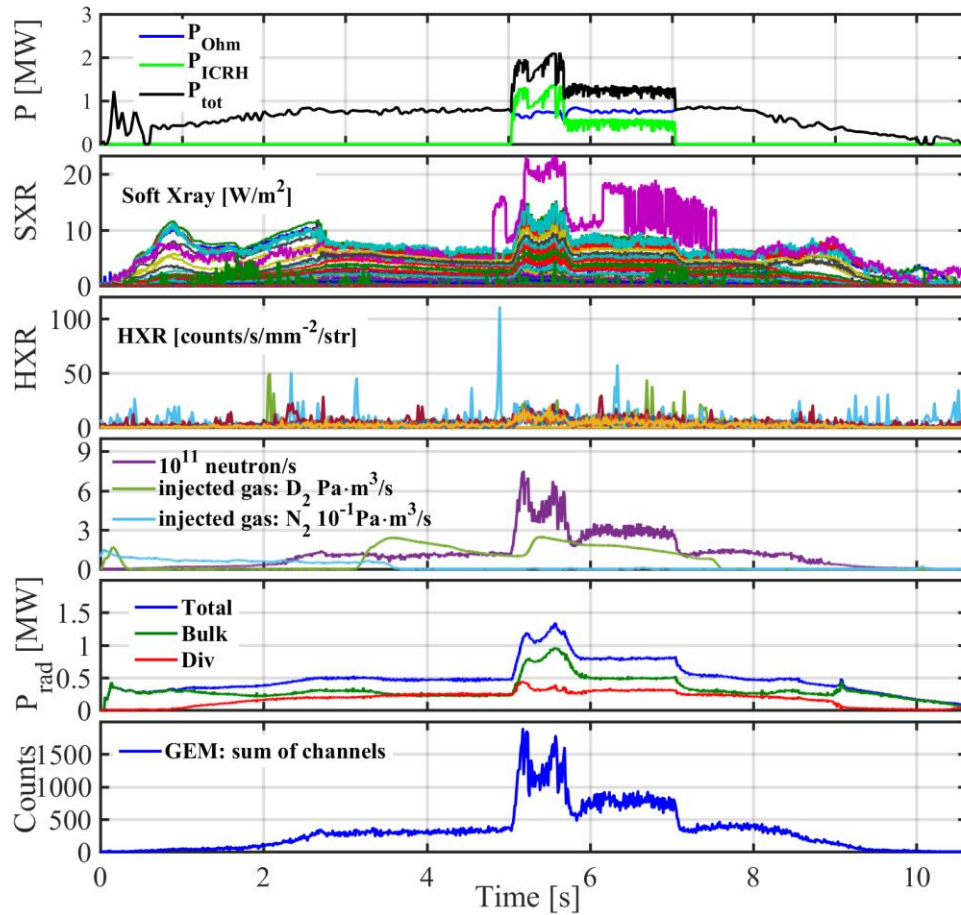
Tomography system for WEST based on GEM detectors

- Vertical system have been installed at the end of 2018 (85 LOS (103 channels) installed inside the finger with analogue and FPGA data acquisition boards, and main computation unit);
- permanent access, control and data acquisition through Control Room over internal network,
- working with the global trigger acquisition mode in order to diagnose the quality of the system, whole GEM detector snapshot is created, 103 channels acquisition supported,
- connected, verified and working external trigger from WEST for acquisition directly related with plasma cycle (start and stop), timescale is proper for comparison with other diagnostics
- system was measuring plasma radiation during the experimental campaigns,
- custom water cooling unit - works properly and keeps proper temp.
- first automatic acquisition mode was implemented for registration of ^{55}Fe and plasma without user operation,
- multiple laboratory tests with ^{55}Fe isotopes and X-ray tubes.



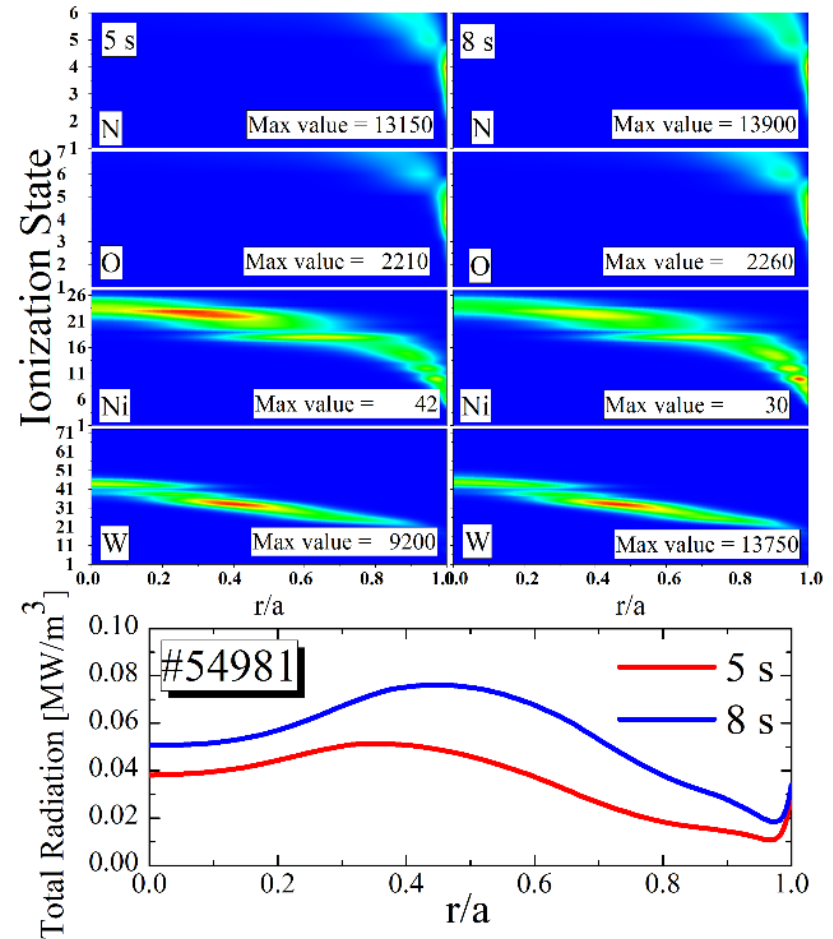
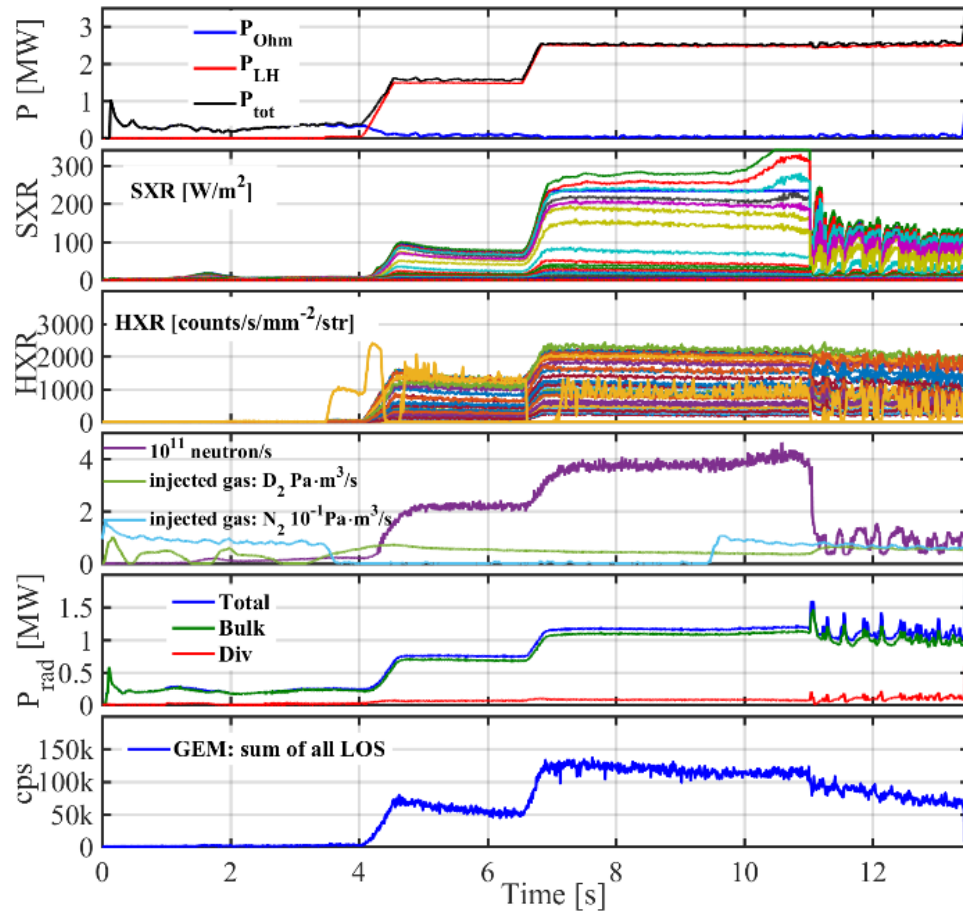
First results, C4

GEM signal follows rather SXR data. Numerical tools are under development to calculate total radiation and soft X-ray spectrum from WEST plasmas.



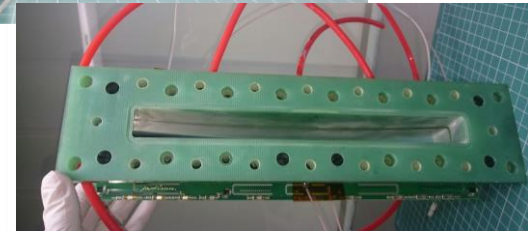
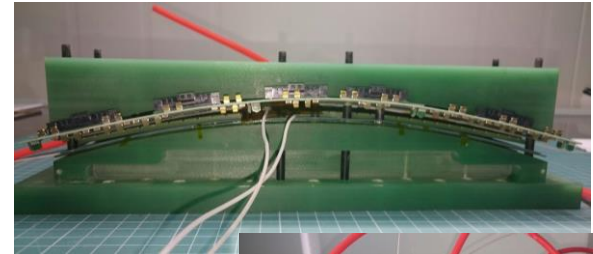
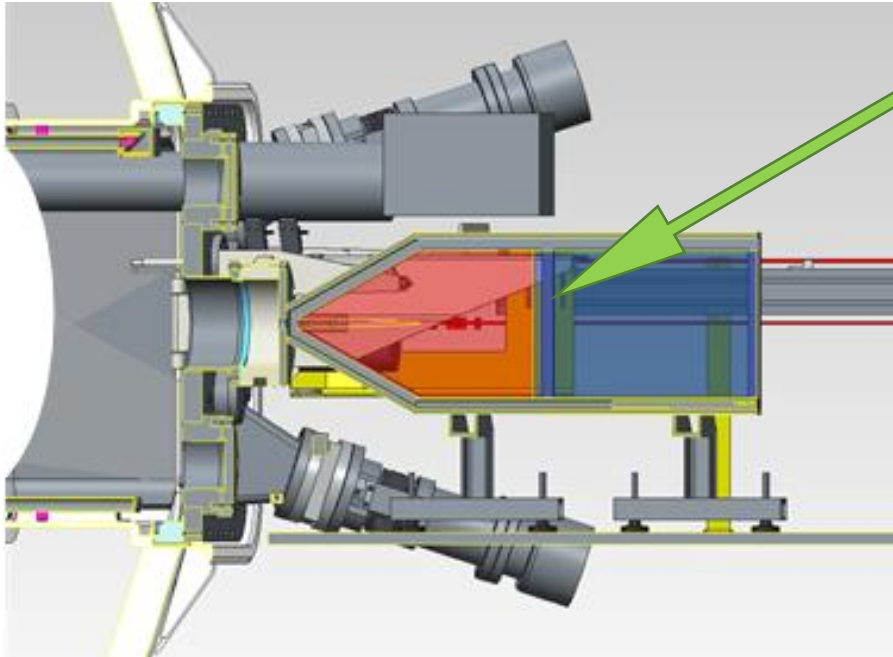
In general, good agreement with DTOMOX was observed (no He in the buffer).

First results, C4



Preparation of horizontal camera installation

- The second detector has been constructed and is under tests and optimization at IPPLM Laboratory
- Detector signal processing module is under preparation
- Supporting structure is ready at CEA



Timeline

Main goals of the ongoing work:

- Acquisition issues => Improvement of the detector signal acquisition, preparation of the final acquisition tools
- Finalization of all the on-site support systems
- Second camera installation and foreseen visits – support is really needed!
- Integration with WEST database
- Validation and commissioning
- Delivery of tungsten distribution

The work is mainly performed in frame of the WPTE and national resources but other financial support is needed!

