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Light and metallic impurity identification in the 225-302 Å range in the WEST Tokamak

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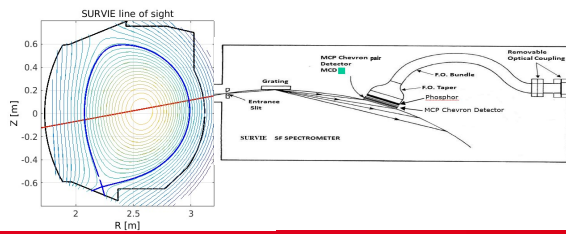
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*<http://west.cea.fr/WESTteam>

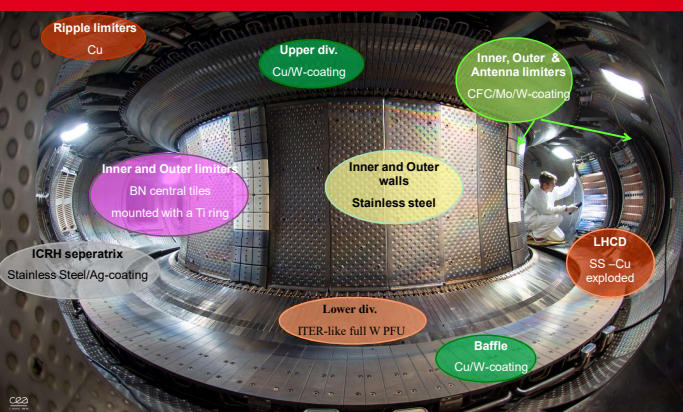


I- VUV SURVIE spectrometer principle



- Fixed central line of view
- One grating **6001/mm**
- One fixed detector (pair of microchannel plates and P screen)
- PI SCX 1300 Princeton CCD camera of 1340x1300 pixels (20µm x20µm pixel size)
- Spectral range: **225-302 Å**
- Acquisition frequency 11ms
- Real time acquisition to ensure microwave antennae safety via heating power reduction strategy using empirical threshold
- Together with an off-line acquisition for physics use

II- Line identification on WEST



Line identification depends on :

- specific events during plasmas: e.g. B, N or Ar injection
- plasma facing components support: e.g. inner limiters support → B, N and Ti lines
- plasma conditioning phase: Cl, O lines
- LHCD phase: Cu and W lines
- ICRH phase: specifically Ag lines

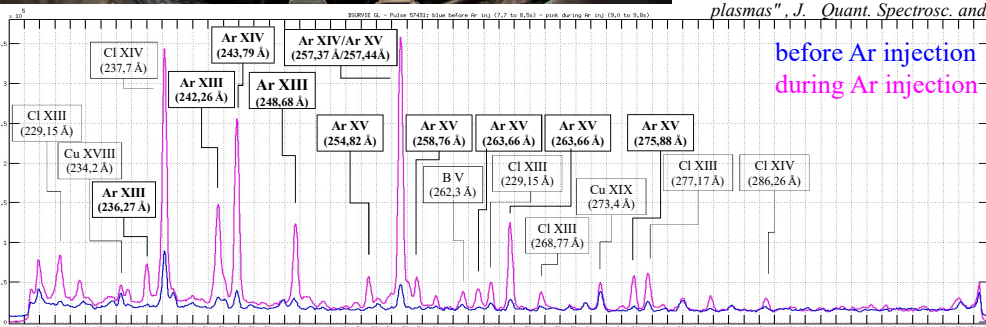
It relies on : bibliography, R.L. Kelly tables (*),

NIST atomic database (***) and HULLAC(***) code for validation

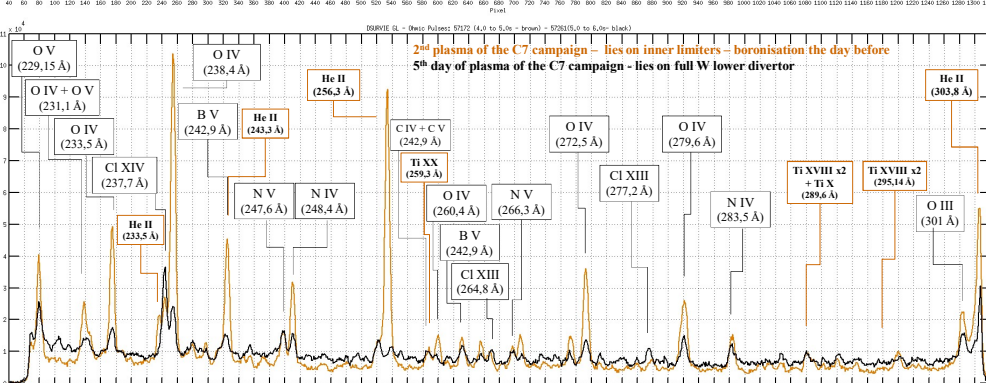
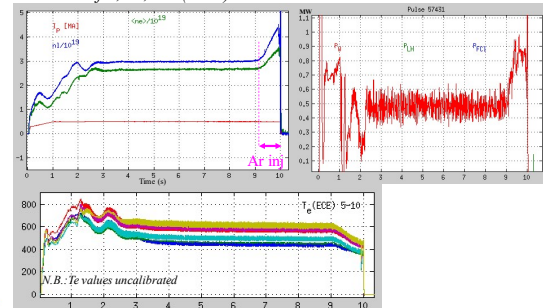
(*) *Journal of Physical and Chemical Reference Data Vol 16, 1987 Supplement N°1*

(**) <https://www.nist.gov/pml/atomic-spectra-database>

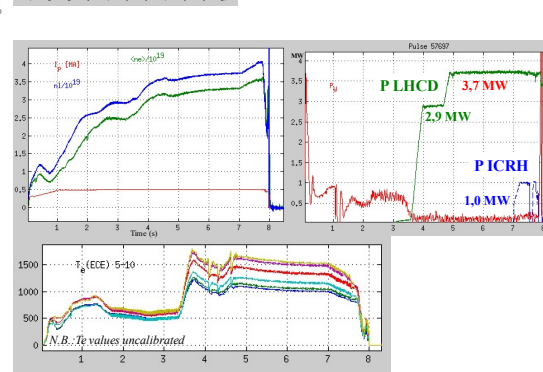
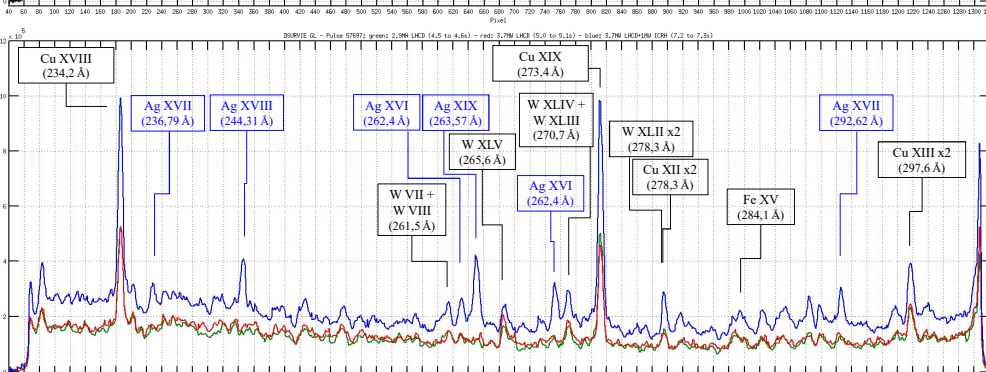
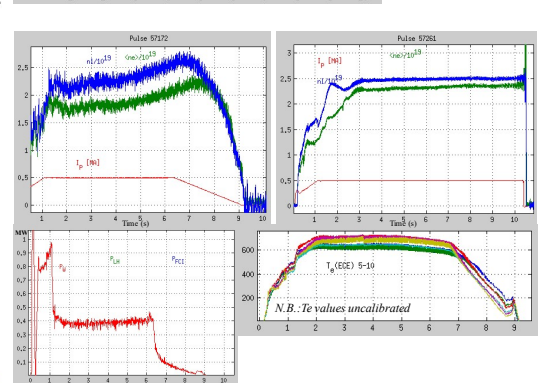
(***) *A. Bar-Shalom, M. Klapisch and J. Oreg, "HULLAC, an integrated computer package for atomic processes in plasmas", J. Quant. Spectrosc. and Radiat. Transfer, 71,169 (2001)*



before Ar injection
during Ar injection



2nd plasma of the C7 campaign - lies on inner limiters - boronisation the day before
5th day of plasma of the C7 campaign - lies on full W lower divertor



Lower diverted plasma injecting first 2,9 MW LHCD, then 3,7 MW LHCD and finally 3,7 MW LHCD + 1,0 MW ICRH