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

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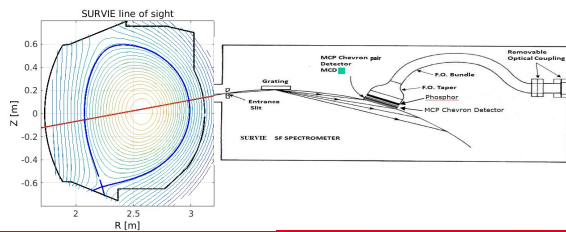
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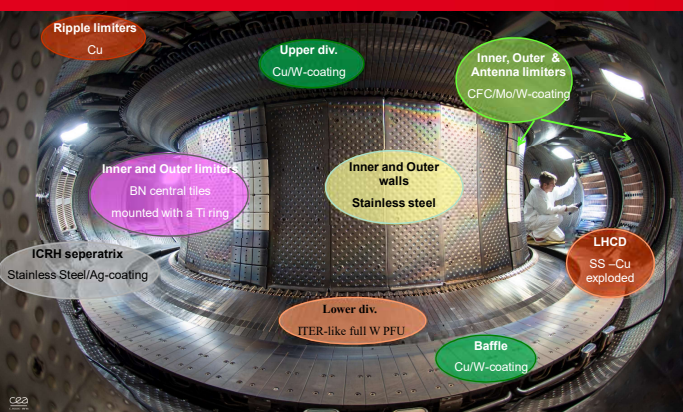
*<http://west.cea.fr/WESTteam>

I- VUV SURVIE spectrometer principle



- Fixed central line of view
- One grating 600l/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

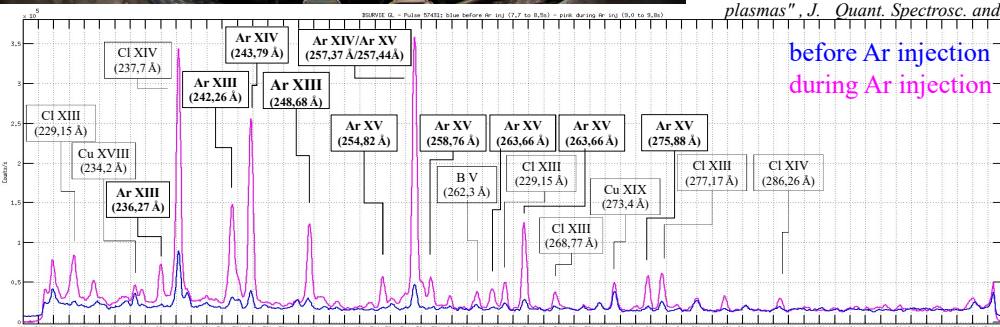
It relies on : bibliography, R.L. Kelly tables (*),

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

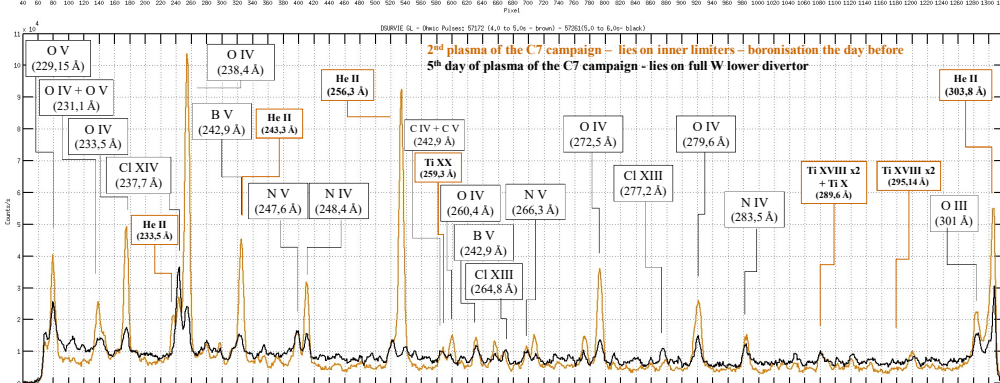
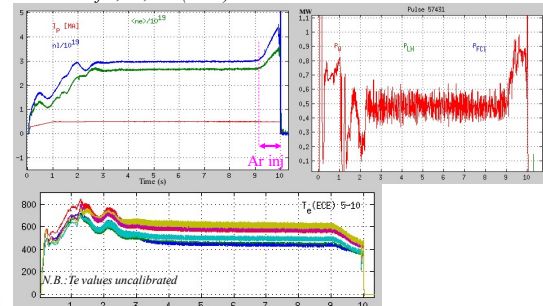
(*) Journal of Physical and Chemical Reference Data Vol 16, 1987 Supplement N°1

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

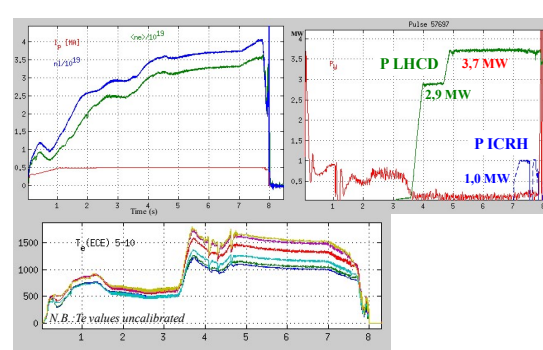
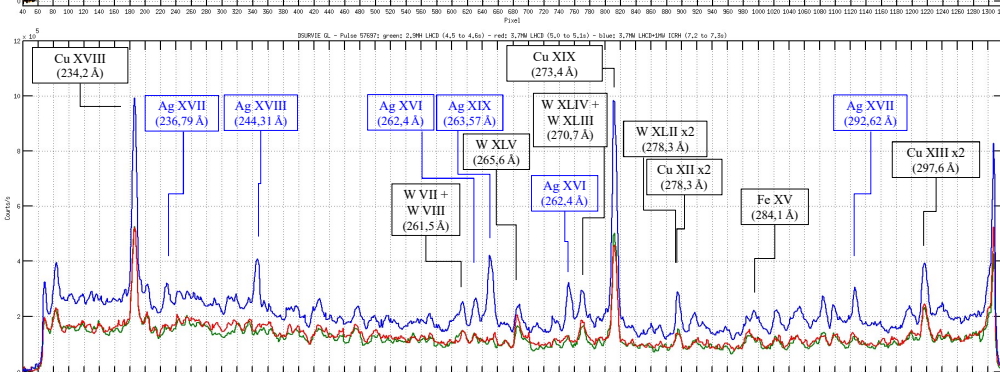
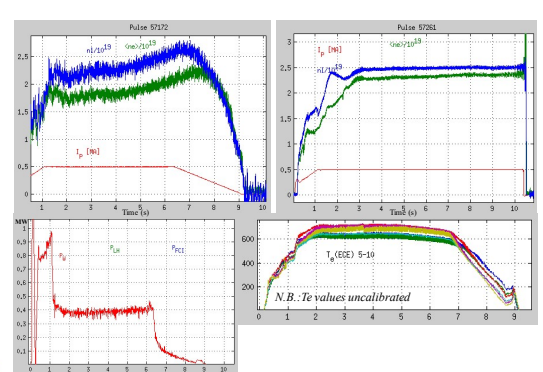
(***) A. Bar-Shalom, M. Klapisch and J. Oreg, "HULLAC, an integrated computer package for atomic processes in plasmas", J. Quant. Spectrosc. and Radiat. Transfer, 71,169 (2001)



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