

WIMAS-8: Synthetic diagnostics

Erik Andersson Sundén
and the WIMAS-8 team

WIMAS-8 deliverables for 2019/20

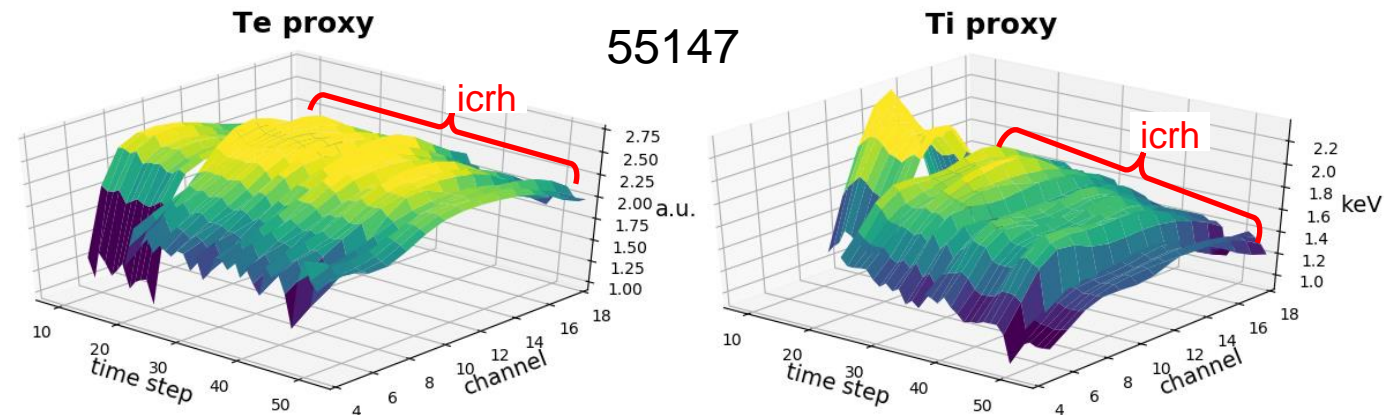
- D1: Plugins for synthetic diagnostics for bolometry
 - D. Vezinet - *in progress*
- D2: Deployment of alpha source actor at JET, maintenance and user support
 - S. Sippila - *ASCOT: Deployed*
 - E. Andersson Sundén and S. Conroy - *DRESS: in progress*
- D3: Release and verification of synthetic neutron diagnostics actor
 - AFSI and DRESS - *in progress*
- D4: Synthetic spectrum of VUV and X-Ray
 - D. Vezinet - *in progress*

Current status of tofu

- Good progress regarding code optimization, [documentation](#)
- Recently released tofu [1.4.4](#) (release notes currently being drafted)
- Improved unit tests and unit tests coverage for better code robustness
- A bit slower than planned:
 - We try to take into account return on experience from users, which regularly leads us to add new features, modify parts, debug issues... but we feel this is good practices on the long run and should be regarded as an asset.
 - The Covid forced us to take some unexpected holidays
 - One of us had some minor health issues that took a bit of time off the planning
 - Also tofu is more and more closely integrated with IMAS (that's where a great deal of user feedback comes from), and since IMAS also changes regularly (a new version every few months), we have to update tofu accordingly every time, which also takes some un-foreseen time.
- Started: Full 3D volume-of-sight computation for all detectors (SXR, bolometry, hard X rays... i.e.: detectors with apertures but no optics associated)
 - will start being included in official releases from version 1.5 only.

More tofu progress

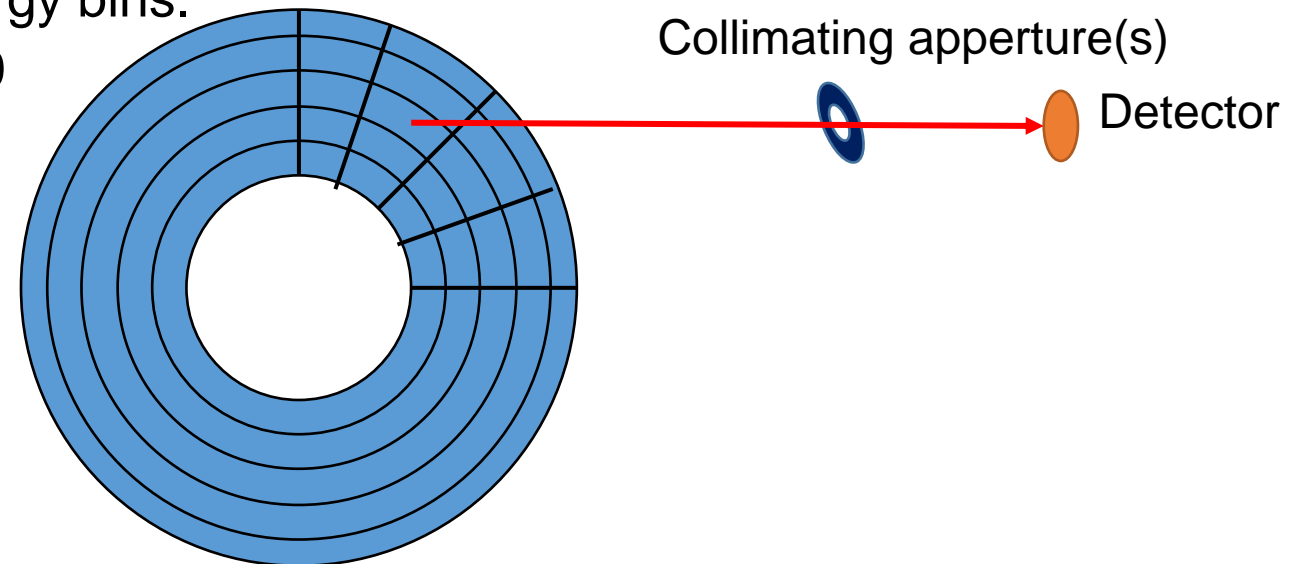
- There a new development branch dedicated to handling 2D X ray spectrometers,
 - not included in official releases.
 - promising results on the analysis of a 2D X Ray spectrometer on the WEST tokamak
 - it recently allowed to calculated T_e and T_i proxys profiles from experimental data for a WEST shot



neutron_diagnostic progress

- [Ticket raised](#) to allow for:
 - full use of the Volume integration capabilities of DRESS
 - Voxelisation of plasma volume in R, Z and Phi.
 - Better resolved energy measurements
 - Current version only allows 8 energy bins.
 - Typical number of bins ~500-1000

- What is the preferred way to store this kind of machine specific data?



Voxelisation of plasma volume (dR, dZ, and dPhi)

Progress

- Still on time according to timeline presented on APM in February.
- A PhD student will join the Uppsala University team
 - Linus Hägg
 - Will be present during the code camp in June as a "first appearance"



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WIMAS8 – CHERAB

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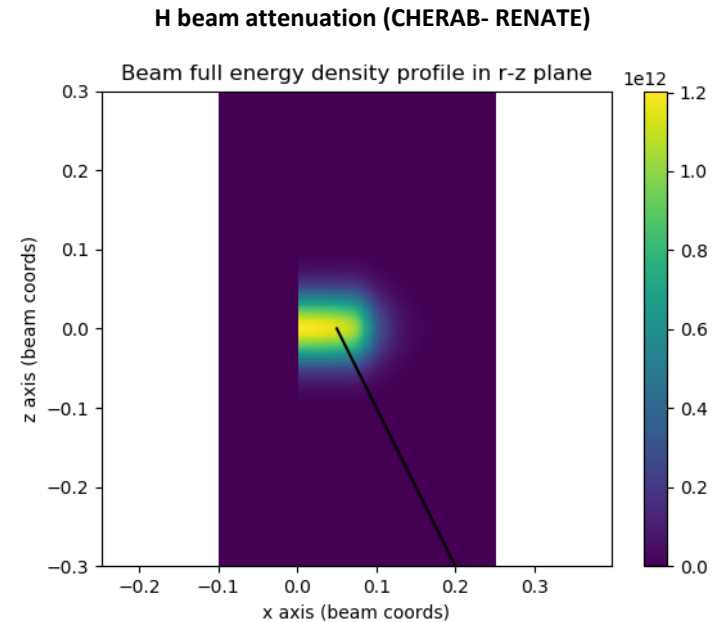
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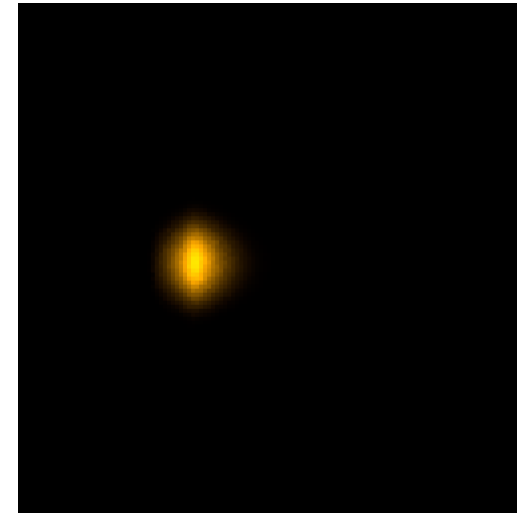
CHERAB applications in IMAS

Status:

- Implemented some basic test tutorials with standard CHERAB worlds.
- Initiated **CHERAB** → **RENATE-OD** calculations with 1D fluctuated profile.
- Integration tests are OK for RENATE-OD
- Started collaboration with group from Ljubljana (M. Brank and L. Kos)
- Application of **CHERAB** with **SMITER** → aimed at heat load observations with synthetic VIS cameras
- Took over cherab-iter (imas) repository (<https://git.iter.org/projects/DIAG/repos/cherab-iter/browse>) currently fixing cherab-imas interactions.
- Have problems running higher functionalities of CHERAB due to python environment issues.
- Exploring application of **virtual environments** to run CHERAB → in stand alone version and kepler actors as well. (<https://jira.iter.org/browse/IMAS-2944>)
- CPT is helping us with current problems (all is OK.)



Na emission (CHERAB- RENATE)



Thank you for your attention!