# Some notes on CHEAP development

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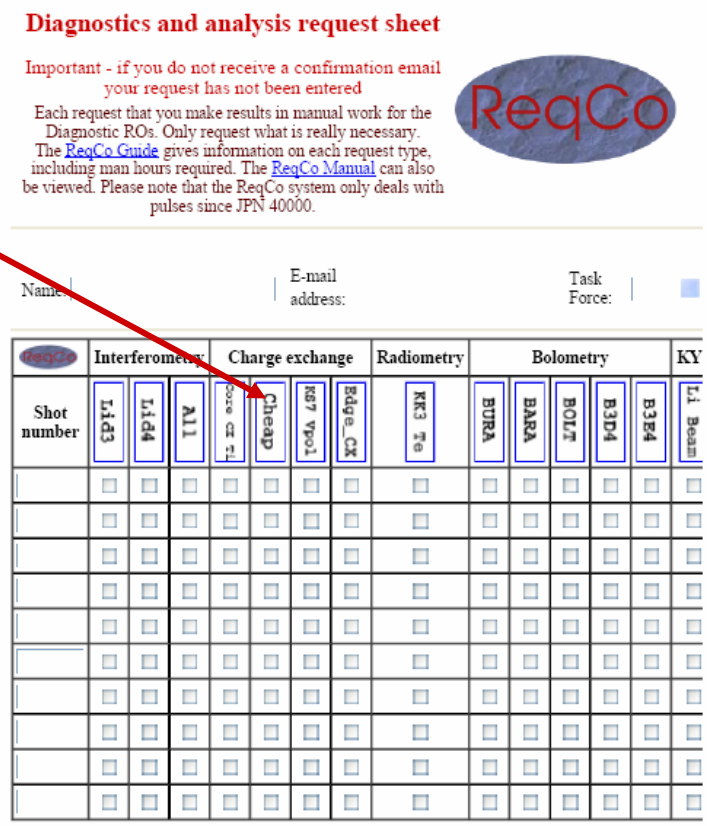
# What is CHEAP?

- Different things to different people!
- Requests for CHEAP on JET mainly for concentrations but also for cross-section corrections to temperature and rotation
- For us it is an important tool for consistency checks (stored energy, neutrons, Zeff)
- It is also the tool to reprocess data with changed relative calibration and alignment without having to re-fit the spectra



**Diagnostics and analysis request sheet**

Important - if you do not receive a confirmation email your request has not been entered

Each request that you make results in manual work for the Diagnostic ROs. Only request what is really necessary. The ReqCo Guide gives information on each request type, including man hours required. The ReqCo Manual can also be viewed. Please note that the ReqCo system only deals with pulses since JPN 40000.

ReqCo

Name | E-mail address: | Task Force:

| ReqCo | Interferometry | | | Charge exchange | | | | Radiometry | Bolometry | | | | | KY |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Shot number | Li d3 | Li d4 | All | Core CX Ti | Cheap | KS7 Vpol | Edge_CX | KK3 Te | BURA | BARA | BOL7 | B3D4 | B3E4 | Li Beam |
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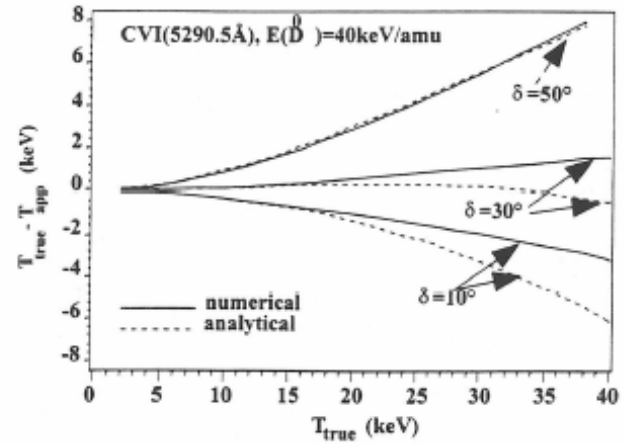
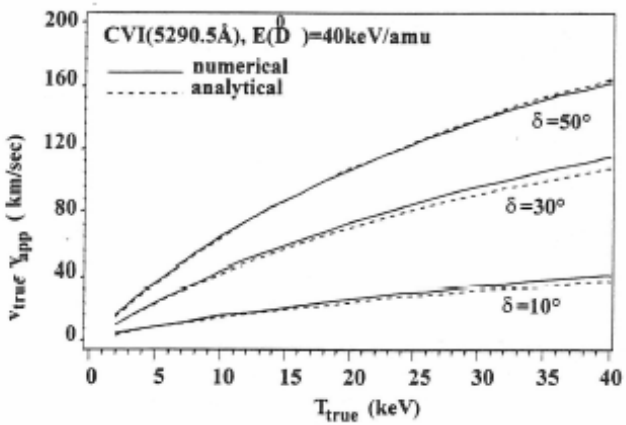
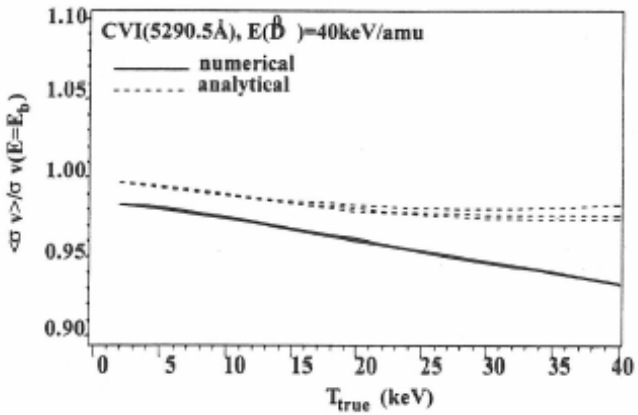
# Changes triggered by integration with CXSFIT

- Recently made changes to CHEAP to read PPFs created by CXSFIT as well as KS4FIT
- Conscious decision NOT to try to replicate the data types of KS4FIT with CXSFIT except for those the customers look at
- In the process of breaking the exclusive link between the two codes, changed the way of identifying the CX transition. Now using Nuclear charge, target ion charge and upper and lower quantum numbers (e.g. C+6, n=8⇒n=7).
  - This will make it easier to introduce new CX lines. Simply add the cross-section and the code will do the rest for you.
  - Proposal #1: To make this fully automatic, need to change the code to treat any species rather than a predefined list (K-DZ)
- While thinking about this I re-discovered the fact that the cross-section effects are provided by Manfred, not by ADAS.
  - Would not change if ADAS data are updated unless we ask Manfred to do it.
  - Proposal #2: develop an ADAS series program for this task (MGvH, ADW)




# Apparent and true temperature and rotation

'Analytical Approximation of Cross-Section Effects on Observed CX Spectra in Hot Fusion Plasmas'
M.G. von Hellermann et al, Plasma Physics and Contr. Fusion, 37, 71 (1995)

Present version of the look up table in CHEAP also includes contributions from n=2 beam neutrals

(unpublished?)

# Thanks to CXSFIT we can decouple CHEAP from instruments

- With the “Replay” feature of CXSFIT it is no longer a big overhead to re-analyse spectra (history is written to PPF)
- All necessary instrumental data could be written to the PPF and CHEAP would read it from there
- There is of course a legacy problem with all data analysed by KS4FIT, so it would still be quite messy if the present version of CHEAP was adapted to do this (K-DZ)
- We need a universal CHEAP anyway as a partner for CXSFIT (LDH, ADW, MGvH, K-DZ?)