



# Highlights of next ADAS release (v3.2)

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## ADAS 3.2 — 2012

- ▶ Large amount of data in this release.
- ▶ Enhanced non-interactive (offline) codes.
- ▶ Minor updating of interactive codes.
- ▶ Quotidian bug removal.
- ▶ IDL v8 and its appropriation of useful variable names.
- ▶ Two beta programmes — testers required.

## Uplifted baseline data

AUTOSTRUCTURE has been updated to generate distorted wave (DW) *adf04* in a very efficient fashion.

- ▶ DW is the new baseline quality data for excitation for low to mid-Z elements.
- ▶ Complete set of DW (and PWB) for H to Zn.
- ▶ Type 1 data for all ions — aids non-Maxwellian modelling.

See `/home/adas/adas/adf04/cophps#SEQ/`

## R-matrix excitation data — sequence

R-matrix is the *best quality* data for complete excitation datasets.

- ▶ He-like, Li-like, F-like, Ne-like and Na-like for H to Kr already in ADAS.
- ▶ B-like from Guiyun Liang will be added.
- ▶ H-like will be run for completeness.
- ▶ We are thinking about archiving the cross section OMEGA files.

See `/home/adas/adas/adf04/copaw#<SEQ>/`

## R-matrix excitation data — other ions

R-matrix is the *best quality* data for complete excitation datasets.

- ▶  $S^{+8} - S^{+11}$  from Guiyun Liang.
- ▶ Neon: 1, 2, 3, 4, 5, 6, 7, 8, 9 from Auburn (John Ludlow, Don Griffin, Brendan McLaughlin and Dario Mitnik).
- ▶ Argon: 0, 3, 4, 5, 7, 8, 10, 11, 12, 13, 17 from Auburn (John Ludlow and Connor Ballance).

See `/home/adas/adas/adf04/<SEQ>like/`

## Reference data

Some atomic quantities can be known to a higher precision than others.

- ▶ *adf00* Ionisation potentials and ground configurations from NIST added for many elements.
- ▶ *adf00* now has LS and IC variants with state quantum numbers.
- ▶ *adf04* configuration, quantum numbers and energy level **only** datasets for H to Kr.

See `/home/adas/adas/adf00/`

See `/home/adas/adas/adf04/nist#<Z>/`

# GCR revision

GCR is the most refined method to produce effective coefficient data.

- ▶ Relies on quality of fundamental data.
- ▶ Selective revision of H, He, C, O, N and Ne ions.
- ▶ New set of data for B.
- ▶ Extension to Si and Ar.
- ▶ Li and Be cannot be improved at this time.

See `/home/adas/adas/adf04/adas#<Z>`

See `/home/adas/adas/adf11/<PRS>12/`

See `/home/adas/adas/adf15/<PRS>12/`

# Tungsten

The grand challenge for atomic data for fusion.

- ▶ Neutral tungsten, WI, *adf04* following U Mons structure.
- ▶ WI *adf13* and *adf15* coefficients.
- ▶ *adf11/scd* data with CADW ionisation with adas316 bundle-n density dependence.
- ▶ *adf11/plt* power with CA top-up.
- ▶ *adf11/acd*, *adf11/prb* delayed to incorporate  $W^{+20}$  DR results.
- ▶ Thomas Pütterich *adf11* acd, scd, plt and prb data archived with year 50.

See /home/adas/adas/adf11/<PRS>tbd/

## Other data

ADAS aims to archive data which is useful and needed.

- ▶ Revised H beam emission *adf22* coefficients (Ephrem Delabie).
- ▶ Minor effect on stopping but revised *adf21* also available.
- ▶  $\text{Li}^{+2} + \text{H CX}$  *adf01* (for EAST modelling) was strangely absent. Cross sections from universal formula and *adf12* emission coefficients added.
- ▶ Stopping coefficients for Argon at MeV beam energies added (DEMO modelling).
- ▶ Last (?) of the resolved DR iso-electronic sequences. Al-like from Sh. A. Abdel-Naby (WM) and Nigel Badnell.

# offline\_adas codes

## Enhancements to non-interactive codes.

- ▶ Designed for non-interactive use.
- ▶ Most are fully operation on ADAS computer.
- ▶ Each code is self-contained to allow simple porting to other machines where dimensions etc. can be easily changed.
- ▶ ADAS7#1 brought in line with latest AUSTOSTRUCTURE developments.
- ▶ ADAS7#3 scripts for DW data production.
- ▶ ADAS8#1 (and adas801) updated to incorporate U Mons intermediate files and to refine configuration choice.
- ▶ ADAS8#3 aligned to latest R-matrix developments — this will require the most localization.

# Beta programmes — Looking towards the future

[/home/adas/python/](#)

- ▶ python is now a mature, numerical language.
- ▶ Used extensively in science and is freely available.
- ▶ Insurance against changes in IDL availability and cost.
- ▶ ADAS pipe/socket structure enable a very easy transition.
- ▶ Code for `read_adf15.py` and `run_adas405.py` and some utility routines working and packaging system established.
- ▶ Are they suitably pythonesque? Testers required.

# Beta programmes — Looking towards the future

## ADAS series 9

- ▶ Molecular models and *mdf* data.
- ▶ Will be packaged into ADAS.