



Critical Review of ADAS

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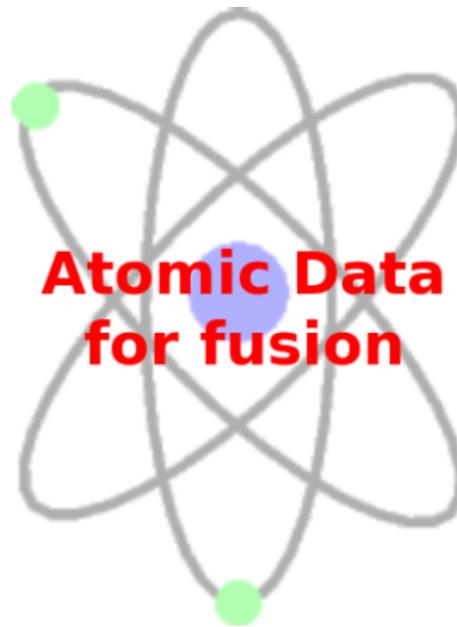
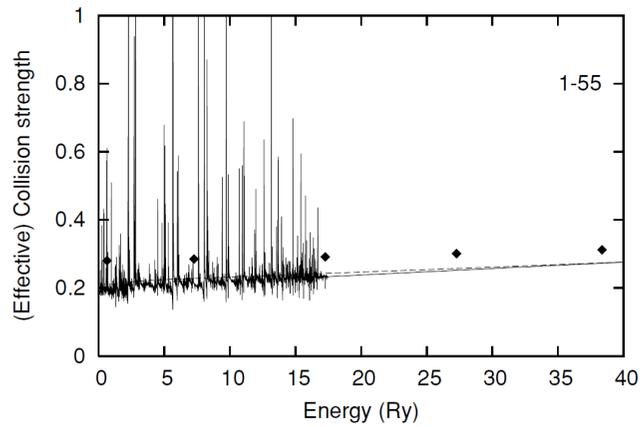
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ADAS — one critical review

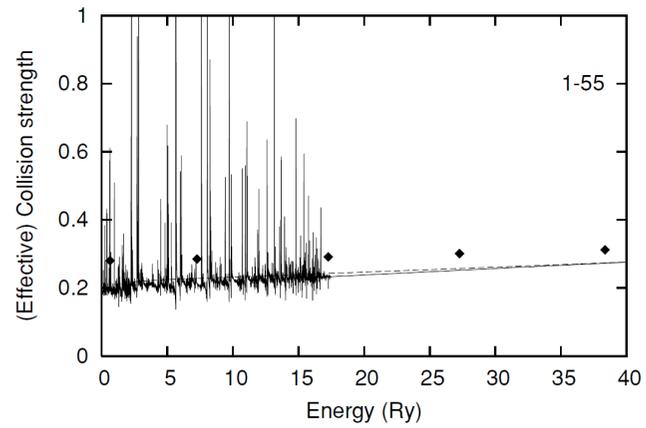




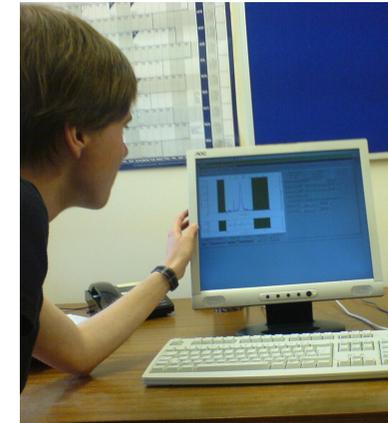
Fundamental data



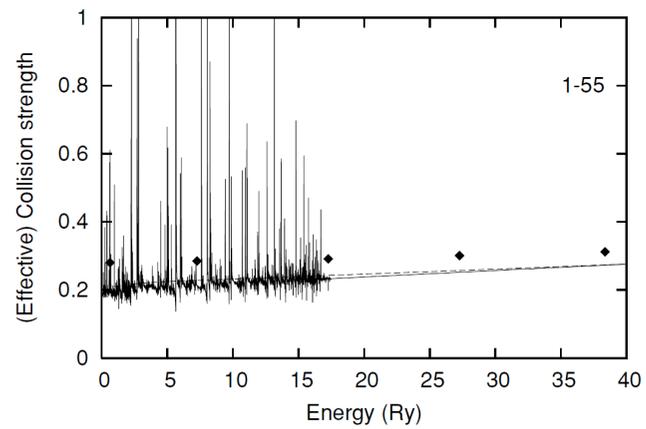
Fundamental data



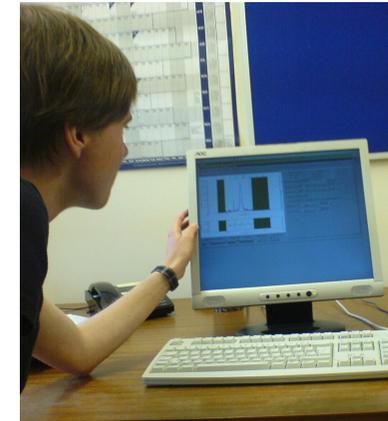
Derived data



Fundamental data



Derived data

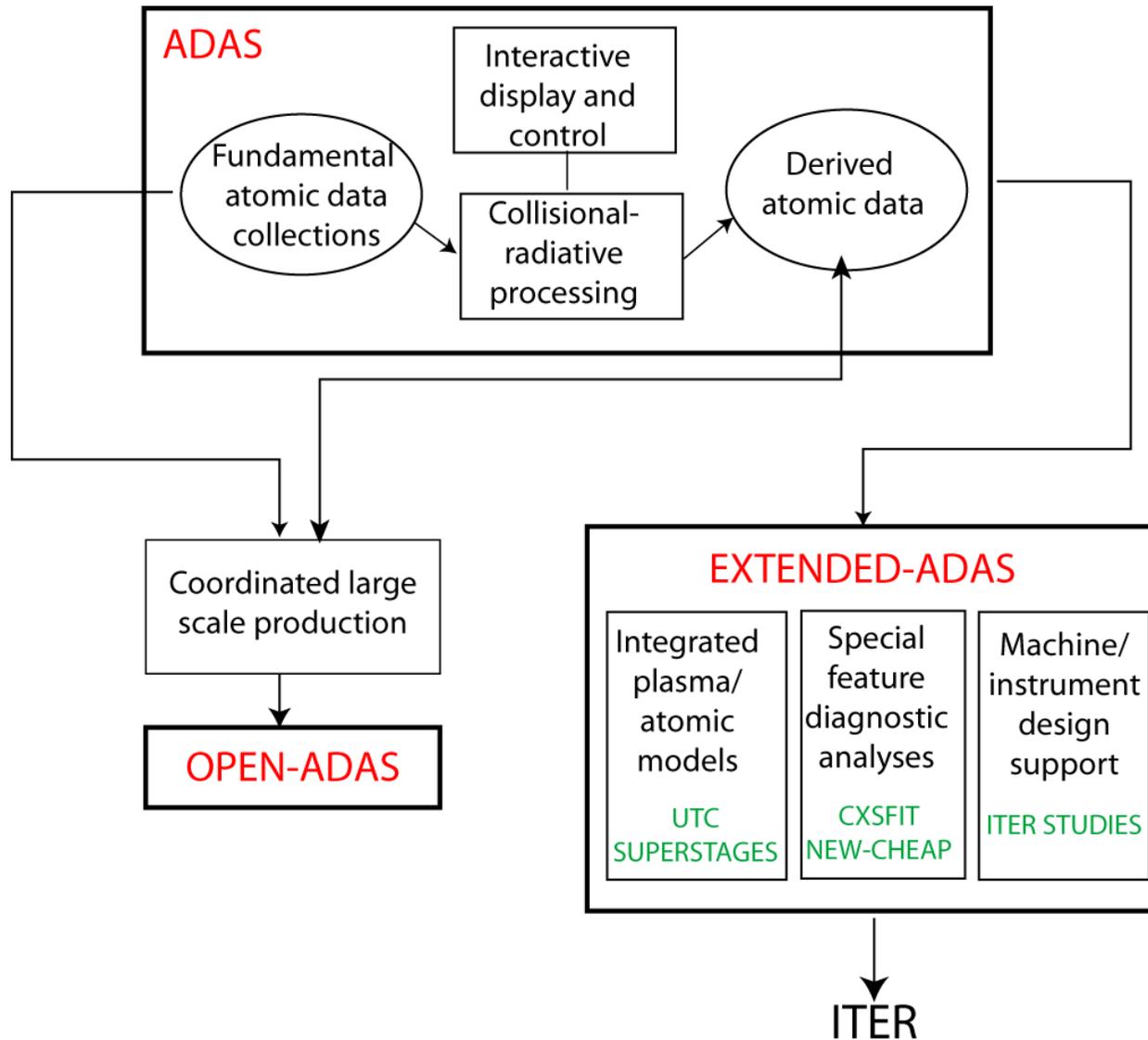


Fundamental atomic data is mediated via models

ADAS — Principles and guiding ideals

- ▶ Moves fundamental atomic data to a form suited for practical use.
- ▶ Comprehensive baseline coverage.
- ▶ Supplemented by high quality data targeted at a specific need.
- ▶ Data is not archived for its own sake — scrutiny is important.
- ▶ Connection and engagements with experiment is crucial.
- ▶ General/universal approach — there is more than one fusion machine/star.

Scope of ADAS



We are acquiring a number of prefixes and suffixes

- ▶ ADAS
— the original code and database.
- ▶ OPEN-ADAS
— initiative with IAEA for wider data provision.
- ▶ EXTENDED-ADAS
— supporting programs for data analysis.
- ▶ ADAS-ITM
— supporting integrated tokamak modelling.
- ▶ ADAS-EU
— 4 year programme to support European atomic data for ITER.

A question

How do you see ADAS?

(a) It's a database

A question

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(b) A point and click system for exploring atomic processes

A question

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- (c) A collection of codes for generating atomic data

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How do you see ADAS?

- (a) It's a database
- (b) A point and click system for exploring atomic processes
- (c) A collection of codes for generating atomic data
- (d) A set of libraries (fortran and IDL) for incorporating into my code
- (e) **All of the above**

Issues for ADAS

ADAS is a reasonably mature system which brings with it certain issues:

- ▶ Maintenance
- ▶ Improvements
- ▶ Developments
- ▶ Usability in a changing environment.

These concerns apply to both data and codes.

How ADAS changes

Over the last few years we have identified a number of areas that required attention and grouped the activity as an [ADAS Project](#).

▶ GCR Project

- light species (no B or F yet) with 96 identifier
- lithium added last year
- Summers et al, PPCF 48, (2006), p263 one of the most cited papers.
- But showing its age.

▶ DR Project

- intermediate coupling, state selective, dielectronic recombination rates.
- many papers in Astron. & Astrophys.
- Mostly finished
- Perhaps one or two more sequences.
- baseline capability for remaining species coming soon.

▶ Ionisation Project

- CADW code of Auburn group as adas8#2.
- Automatic production of driver files via promotion rules.
- Code in next release — Si, Mg and Ar data — more to come.

▶ Heavy species Project

- One of the most intensive and wide ranging to date.
- Just about finished
- Data beginning to flow — adf04 for W is \sim 2GB!
- Density dependence of ionisation in testing.

Upcoming Projects

▶ GCR Plus

- New data for the earlier elements.
- Extend to argon — via Si and Mg as testing sets.
- Probably never ending.

▶ ADAS-EU

- Hydrogen molecular modelling
- Data archived in new data formats — *mdf*.

▶ CX Project

- Bring various efforts on CX fundamental data together
- Generate data for active W signature with universal method.

▶ Beam Project

- Bring current codes up to modern coding standards
- Re-visit assumptions for data storage
- New approach for directed collisions.

ADAS as software

- ▶ Core routines will remain in fortran
- ▶ Will allow fortran 90
- ▶ In 1995 IDL was best option for GUI under unix
- ▶ 2009 — unix diversity down to solaris and linux
- ▶ 2009 — IDL more compelling for its 'I' than as a GUI toolkit.
- ▶ Cost is still a barrier to IDL
- ▶ Canvass opinion on alternatives.

ADAS documentation initiative

- ▶ Comments in code can be cryptic.
- ▶ Individual dataset may not have sufficient space for detail and motivation.
- ▶ May not be suitable for publication in literature but decision processes and choices should be captured.
- ▶ ADAS note series on website
 - ADAS-C : communications about data in ADAS.
 - ADAS-R : more substantial reports.
 - ADAS-P : perprints.

ADAS: Notes - Mozilla Firefox

File Edit View Go Bookmarks Tools Help

http://www.adas.ac.uk/notes.php

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ADAS

Atomic Data and Analysis Structure

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- News
- About ADAS
- Members
- Documentation
 - Manual
 - Bulletins
 - Subroutines
 - Publications
 - Notes**
 - Theses
- ADAS-EU
- OPEN-ADAS
- ADAS-CVS
- Support / Bugs
- Workshops
 - 2006
 - 2007
 - 2008
 - 2009

ADAS Communications

- Review of proton impact driven ionisation from the excited levels in neutral hydrogen beams. [ADAS C\(09\)-01](#) (09-Sep-2009)
- Photon emissivities for ArI and ArII. [ADAS C\(08\)-01](#) (23-Apr-2008)

ADAS Technical Notes

- CXSFIT — User Manual. [ADAS R\(07\)-01](#) (07-Nov-2007). Also available as IPP Report [10/36](#).

Comments and questions to: adas-at-adas.ac.uk

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