EE-View

Experimental-Evaluated data Viewer. Overview, technical details and demo.

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IAEA Nuclear Data Section Seminar
17 February 2022, IAEA Headquarters, Vienna, Austria

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Motivation

1. What is wrong with present system? *+analyse existing systems*
2. What do we want to achieve? *clearly formulate goal, tasks, users/needs*
3. Technical solution. *observe existing technologies, create prototype, test performance*
4. Plan. *short and long term planning*
5. Implementation. *+ users feedback => iterations, improvement*

(Done: steps 1-3. Now I am on step 4/5)

1. Present system: Web EXFOR, ENDF, CINDA/NSR, IBANDL

a) Oriented to professionals (evaluators, experimentalists, compilers, code developers, ...)

– difficult for newcomers

b) Universal, flexible (any search incl. wildcards, OR/AND/NOT: parameters with several values, ...)

– too many options, some users are lost

– too many parameters and details (e.g. ENDF: 40 MFs, EXFOR: 1500 Quantities)

c) Rich functionality: work with data on deep level, complex operations with data (inverse kinematics and reactions), cross-comparisons data, connections to other databases (EXFOR-ENDF, IBANDL-EXFOR, PDF, DOI, ...), various output formats (2 XML, 3 JSON, GIF/PS/EPS/PDF), etc.

– no simple search in all databases at once

– many operations to achieve simple plot (neutrons, cross-sections)

– too many output options and operations, some users are lost

– etc., etc.

d) Layout: [Request]→[Select]→[Retrieve]→[Download/Plot] changing web-pages

– modern tendency: stay on the same page, change its contents on events

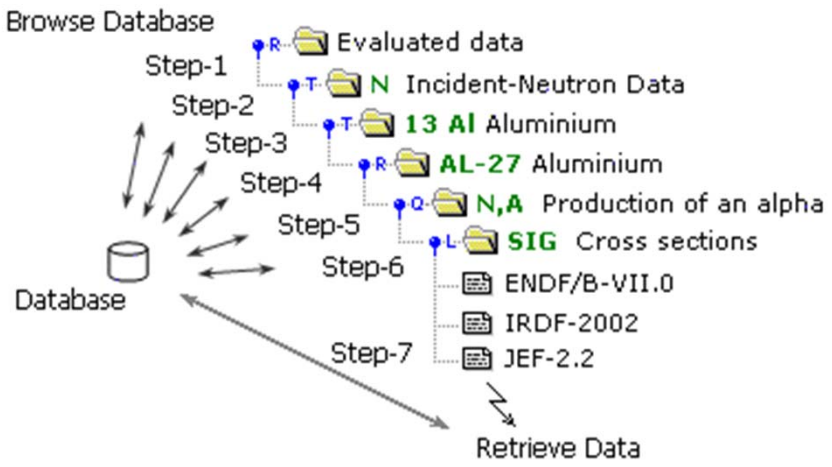
Summary: universal system for professionals (IAEA task?), complicated for general public

Sequential and direct data search

Two basis approaches to build database interface:

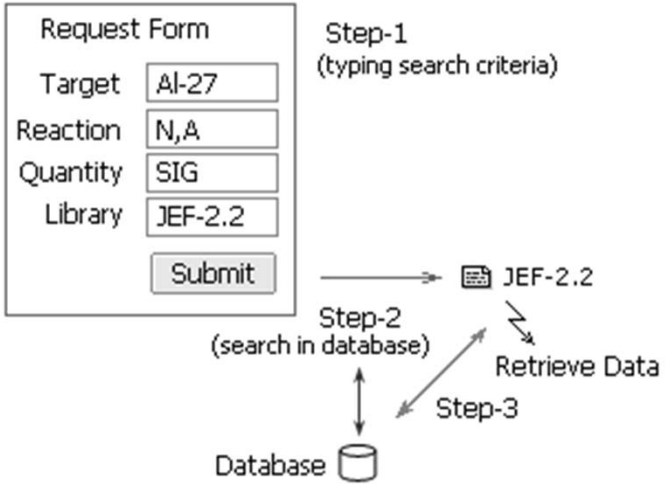
1. Sequential search/selection
2. Direct search

1. Sequential data search/selection



+All operations by mouse: intuitive, free of user's mistakes
+Presents only existing data
+Transparent and clear, gives help-information immediately
- Requires several steps to reach data - slow for experienced users
- Limited number of parameters (depth of the tree)
- Limited integral requests, no intervals

2. Direct data search

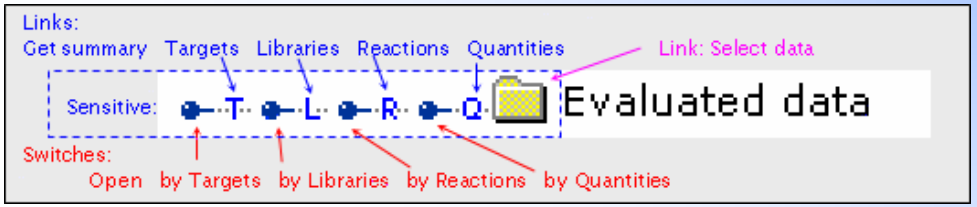


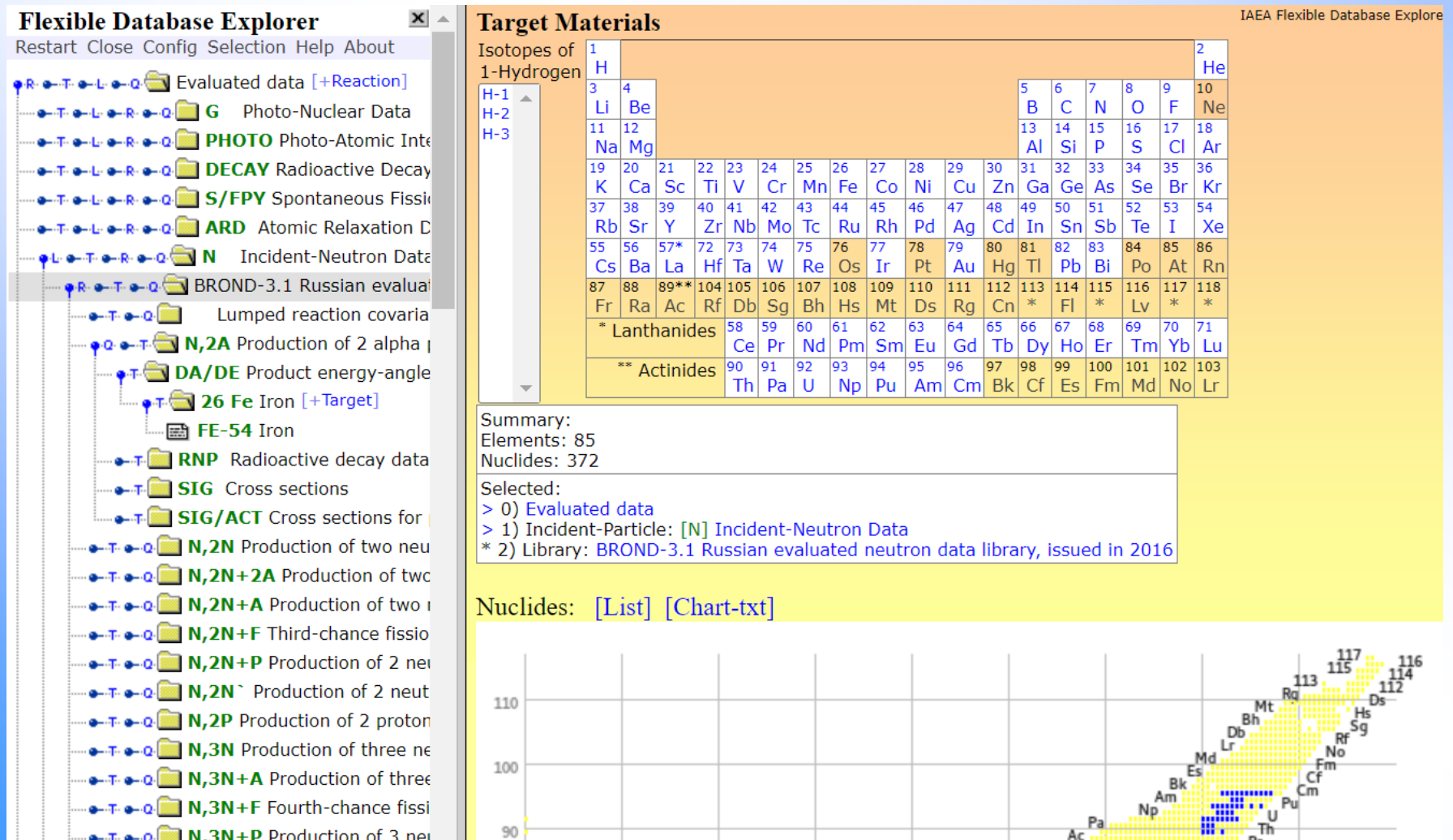
- Needs typing: mistakes are possible
- Needs wider request when data not found
- Requires some knowledge of coding (help-information can be used)
+Fast (one step search) if user knows exectly what is nedeed
+Allows many search parameters and any combinations
+Integral request using wild-cards (*) and intervals

Flexible ENDF Database Explorer (V.Zerkin, 2008)

Overcoming fixed sequence of opening nodes of database tree.

Every layer can be “opened” by all available “switches” in any order.





Examples of existing systems:

1. IAEA EXFOR Web retrieval system https://www-nds.iaea.org/exfor/
2. IAEA ENDF Web retrieval system https://www-nds.iaea.org/endf/
3. IAEA CINDA Web retrieval system https://www-nds.iaea.org/cinda/
4. IAEA Ion Beam Analysis Web system https://www-nds.iaea.org/ibandl/
5. IAEA Flexible ENDF-database Explorer https://www-nds.iaea.org/exfor/e4explorer.htm
6. USA Evaluated Nuclear Data File (ENDF) Retrieval & Plotting https://www.nndc.bnl.gov/sigma/
7. NEA DB JANIS Java-based nuclear information software https://www.oecd-nea.org/jcms/pl_39910/janis
8. MSU (Russia) Nuclear Reaction Database (EXFOR) http://cdfe.sinp.msu.ru/exfor/index.php
9. CNDC (China) Experimental Nuclear Database http://www.nuclear.csdb.cn/shiyan.html
10. CNDC (China) Evaluation of nuclear databases http://www.nuclear.csdb.cn/endf.html
11. JCPRG (Hokkaido University, Japan) EXFOR/ENDF–Search https://www.jcprg.org/exfor/

EE-View Experimental-Evaluated data Viewer /under development/

1. Cross sections with drop-down choice of data: https://www-nds.iaea.org/exfor/eeview.htm
2. Cross sections with open choice of data: https://www-nds.iaea.org/exfor/eeview1.htm
3. Angular distributions: https://www-nds.iaea.org/exfor/eeview-da.htm

EE-View Experimental-Evaluated data Viewer uses
EXFOR-Relational/X4Pro database

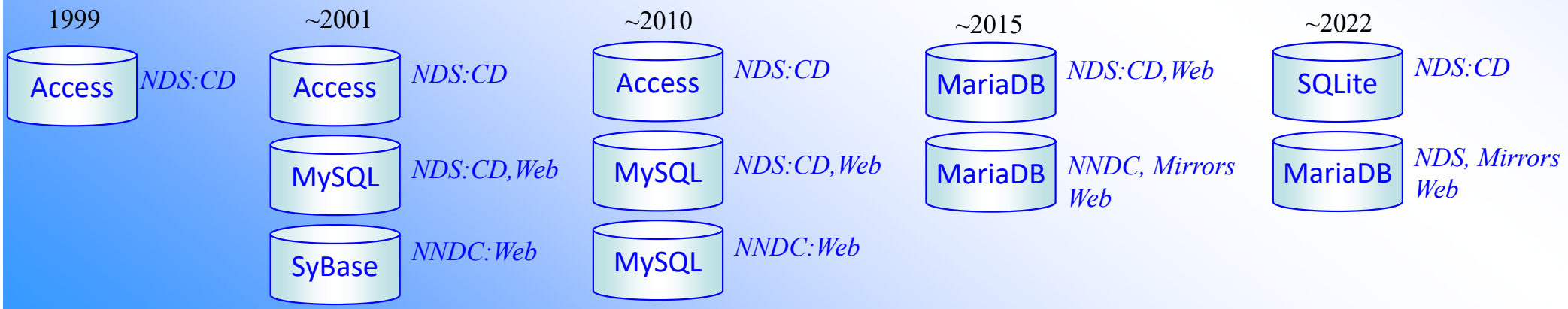
Introduction to X4Pro

Project "EXFOR Relational", 2000-2023

Initial plans in ~2000

1. *All information in EXFOR should be available for search in any order (direct access)*
2. *Execution time of typical request should be within 2-3 sec*
3. *The system should be really platform independent (simplest: no stored procedures, no foreign keys, etc.)*
4. *The system should guarantee integrity of original data*
   - *usage of BLOBs to store EXFOR-SUBENT (zipped)*
   - *data are stored in their original form (EXFOR format)*
   - *convincing other centers to switch to central database*
5. *etc.*

EXFOR-Relational: Platforms



X4Pro - extended EXFOR-Relational database.

X4Pro offers

1. EXFOR data without EXFOR format.
   - *All data points, meta-data, data for corrections are stored in the database and accessible for SQL commands.*
   - *No need in original EXFOR for end-users.*
   - *No need in new EXFOR parsers/converters for new programming languages.*
   - *No need in intermediate files and formats with fixed structure (C5, XML, JSON).*
   - *Simple for programming on any language supporting SQL for data search, filtering, sorting, retrieval, renormalization.*

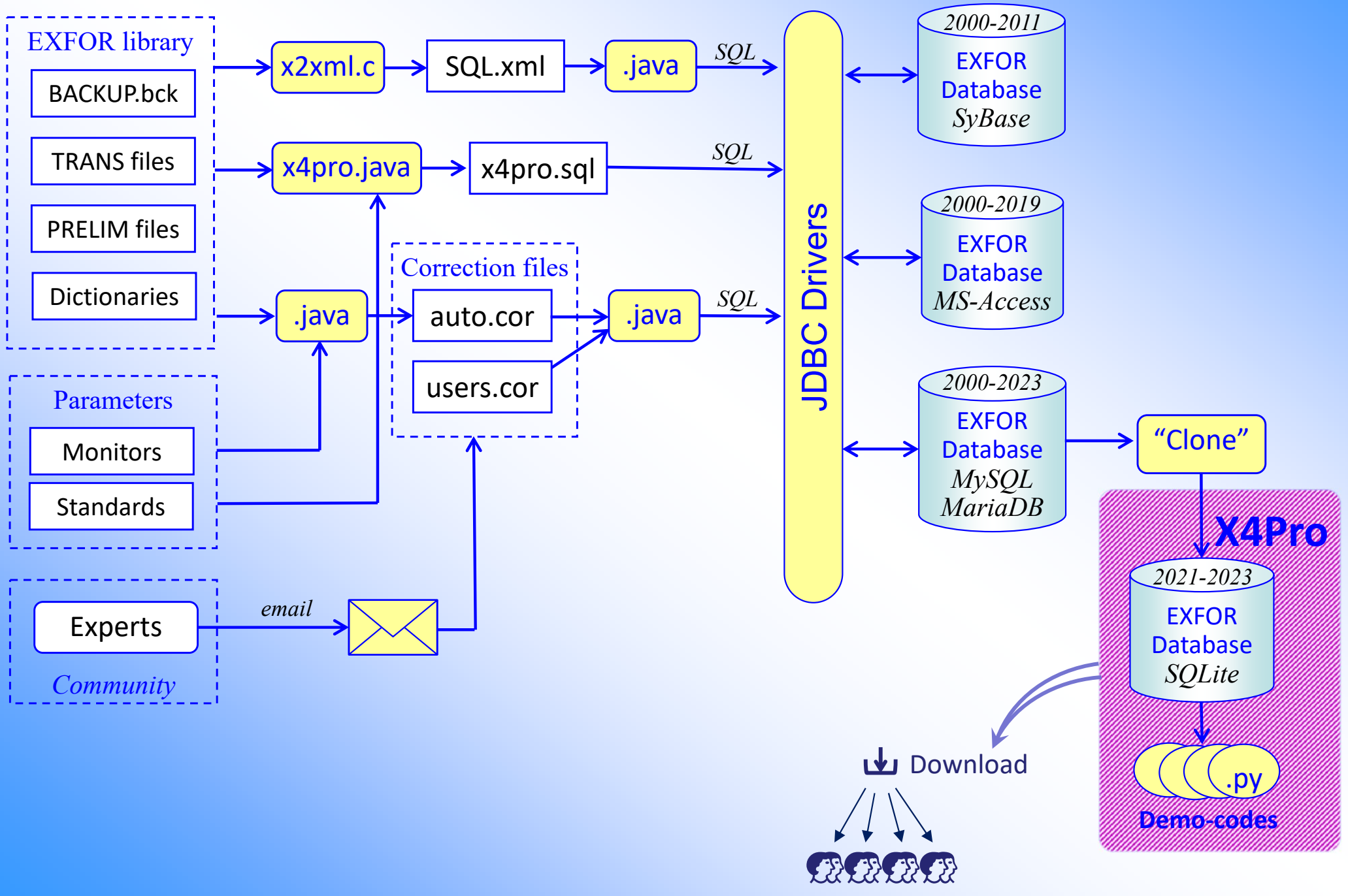
2. Local EXFOR database for programmatic access.

3. Examples.
   24 examples of Fortran and Python programs provided with source code (MIT licence) and "run-me" scripts retrieving and plotting data from local X4Pro and remote ENDF database via Web-API interface.

4. X5-JSON.
   Comprehensive EXFOR data presentation in JSON form.
   Can be used for creating another systems built on JSON objects (e.g. NoSQL databases).
   Example of building CouchDB is provided.

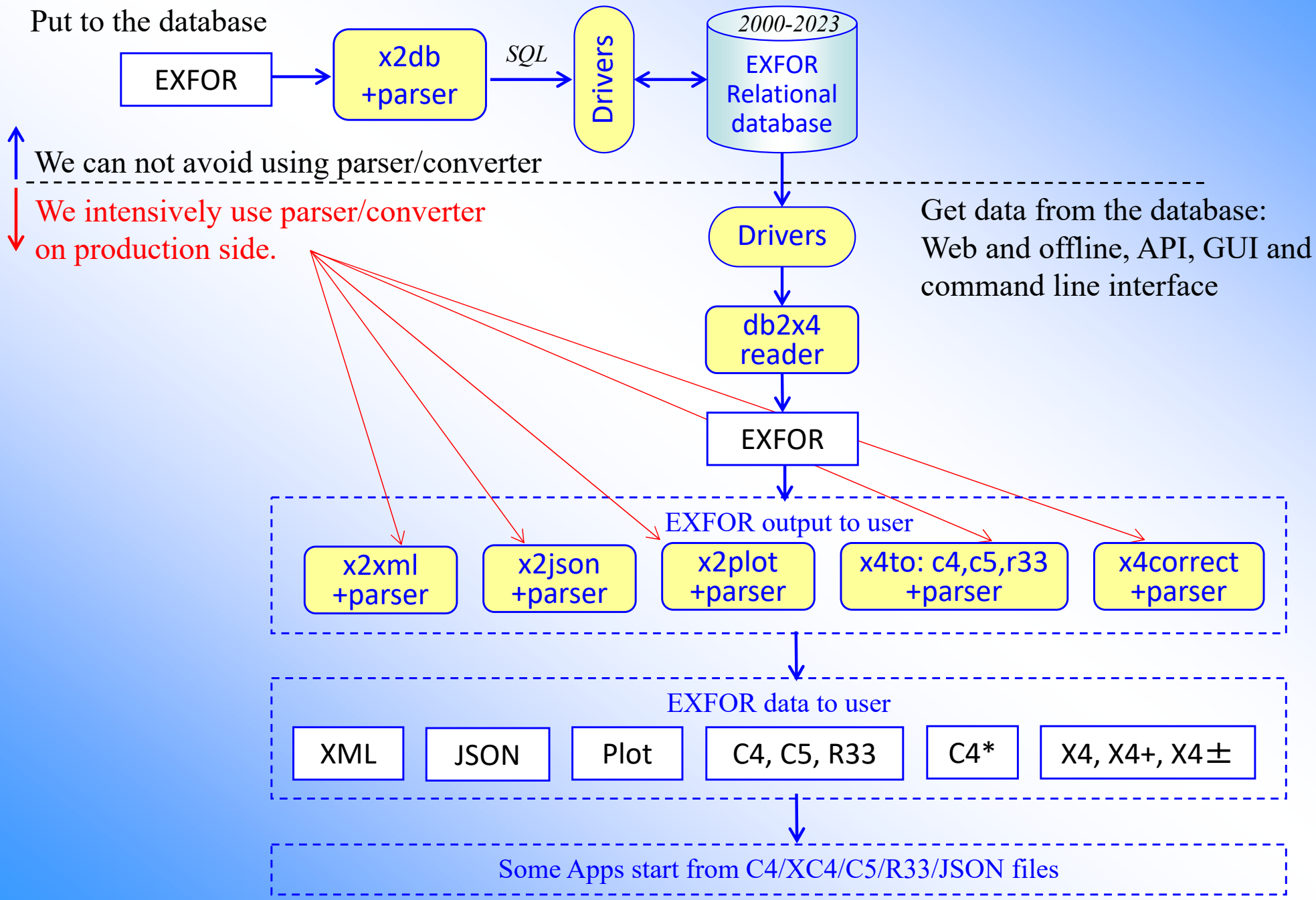
Maintenance of EXFOR relational. X4Pro production.

The system is functioning at the IAEA-NDS and NNDC since 2004

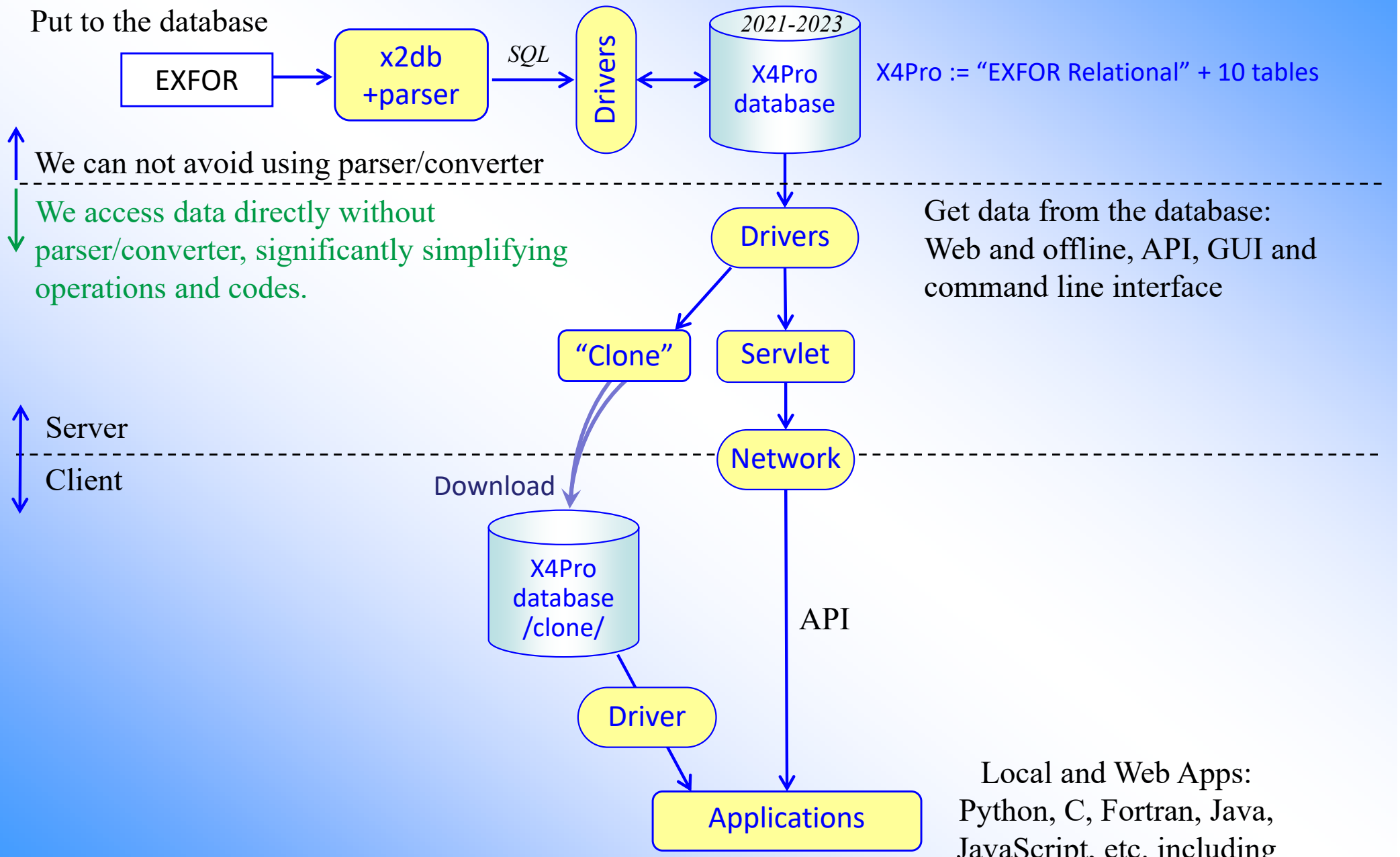


Functioning systems based on EXFOR-Relational

The system is functioning for public at the IAEA-NDS and NNDC since 2004



Systems based on X4Pro



X4Pro tests, demo-codes, platforms and technologies

I. Retrieve experimental data from local X4Pro with evaluated data from Web ENDF retrieval system: Python3 with Plotly or Matplotlib

1. *Cross sections (MF3 + uncertainties from MF33)*
2. *Angular distributions (MF4)*
3. *Emission spectra (MF5)*
4. *Double differential cross sections (MF6)*
5. *Fission yield (MF1)*
6. *Hidden EXFOR data: Mass×TKE distribution, EXFOR data correlations*

for young

II. Retrieve data from local X4Pro using GFortran and GCC

1. *Cross sections (MF3), output C4 file*
2. *Double differential cross sections (MF6)*
3. *Retrieve LEG/RS and SIG from different Subent and generate DA → C4*

for old

III. Data renormalization/modification on Python + Plotly or Matplotlib

1. *Automatic renormalization*
2. *User's modifications*
3. *Experts' modifications (taken from database)*
4. *Ratios to cross sections recalculations*
5. *Retrieve Legendre coefficient L[0] and calculate cross sections*
6. *Retrieve LEG/RS and SIG from different Subent and generate DA*
7. *Retrieve LEG generate DA output draft of R33 (for IBANDL)*

for experts

IV. Populating CouchDB database using X5-JSON in Python

1. *Retrieve X4Z.JSON from table x4pro_x4z store in local CouchDB*

V. Data retrievals from local X4Pro using javascript (+ENDF +Plotly)

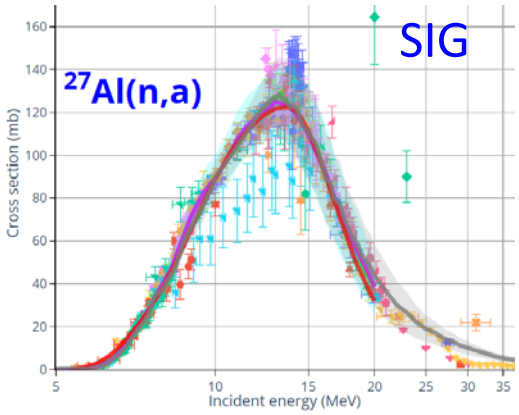
1. *Cross sections (MF3) with GUI/Html5*
2. *Retrievals from javascript under Node.js*

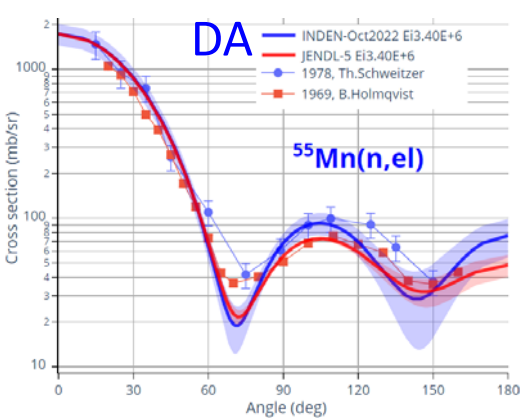
study

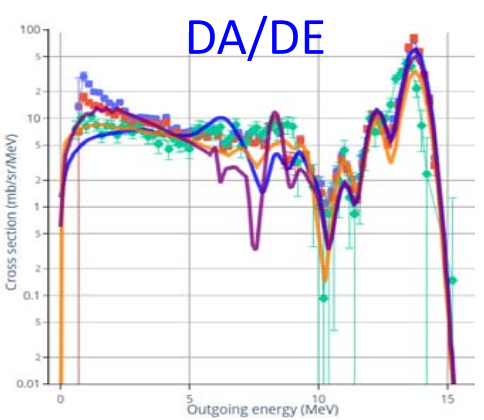
for fun

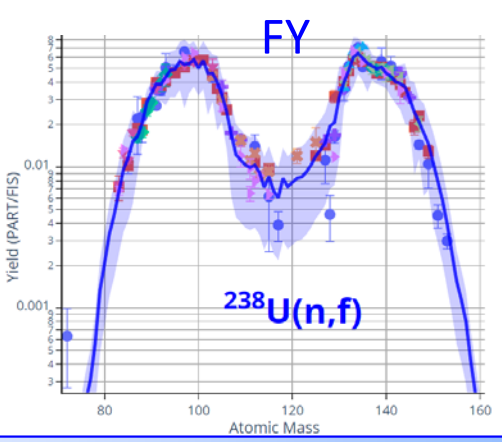
Note. Trial distribution: database file ~8Gb, python codes are built on modules containing ~100 lines each; fortran codes 100-200 lines; item V is not included

X4Pro Python-examples: EXFOR + ENDF/Web

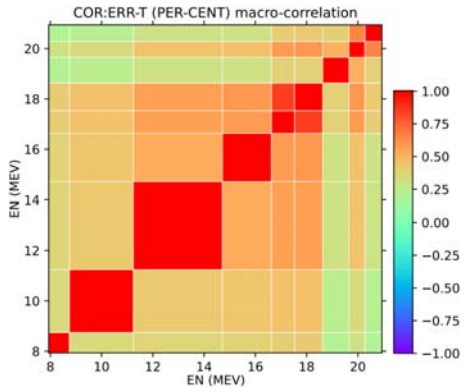


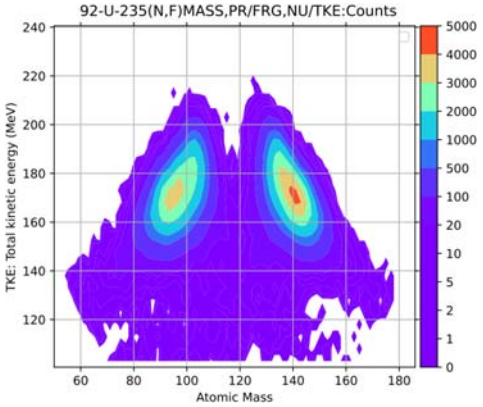


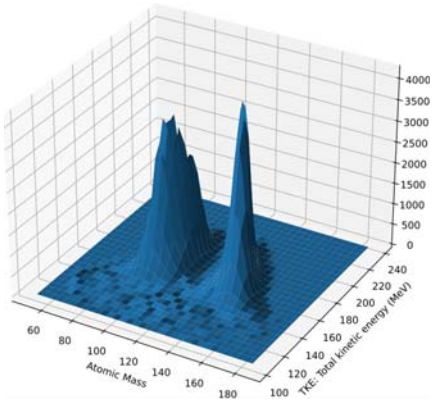




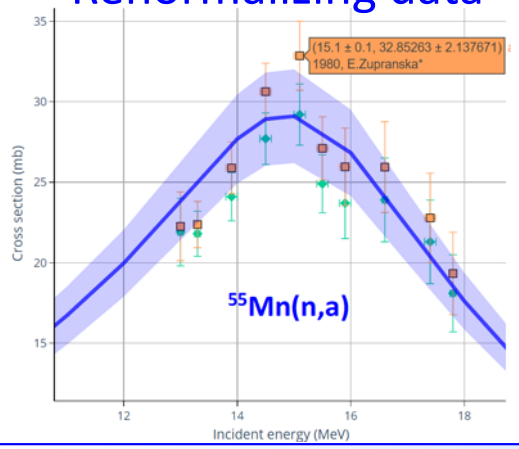
"Hidden" data



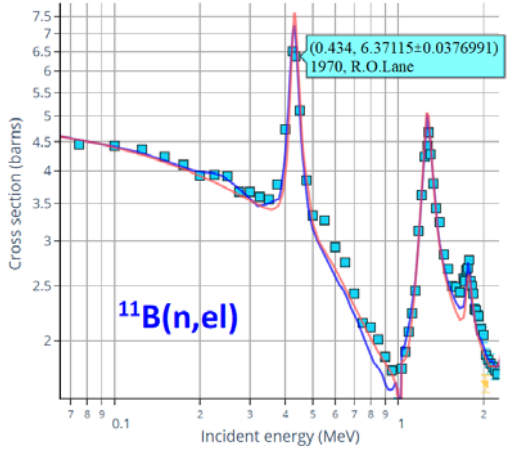


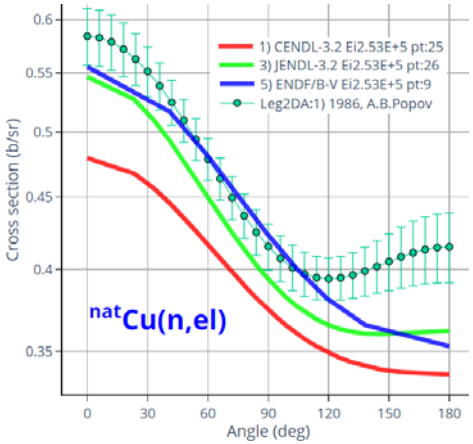


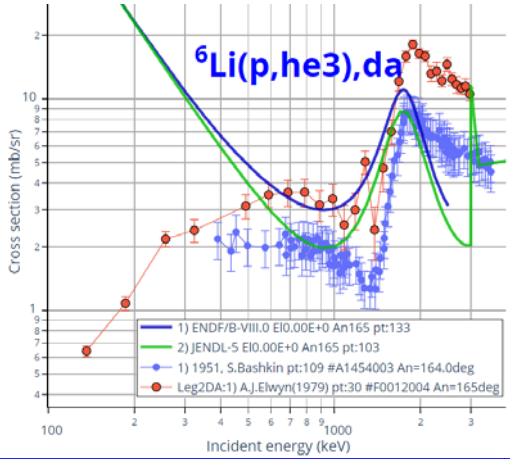
Renormalizing data



"Recalculating" data: LEG→SIG, LEG/RS+SIG→DA, LEG→DA:R33







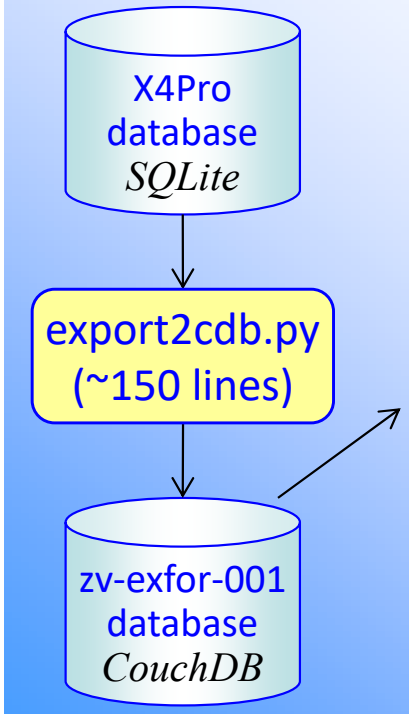
X4-JSON, CouchDB

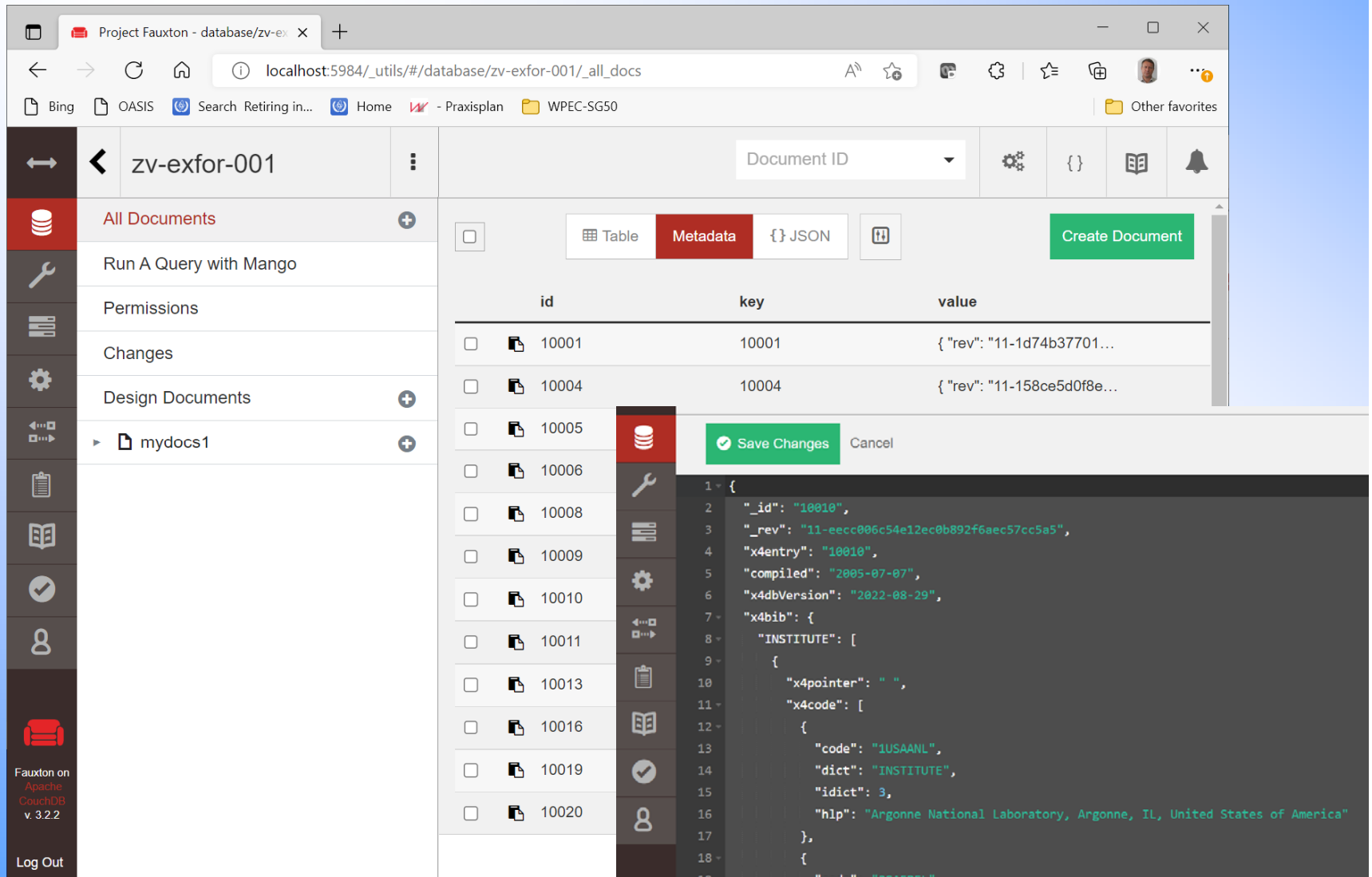
X5-JSON presents meta and numerical data:

1. *from EXFOR and Dictionaries structured as they are in EXFOR - to be useful by compilers*
2. *computational data by Datasets (~C5) including data for automatic correction by new monitor and decay data*

Available on Web-EXFOR as X4Z and X5Z

Example in X4Pro:





Retrieval on JavaScript with GUI-Html5

Access local X4Pro/sqlite3 via html/GUI using javascript
/by V.Zerkin, IAEA-NDS, 2022-04-28/

EXFOR database: "../x4sqlite1c.db", 1.46 GiB, ver:2022-03-23

Build your own Web interface to X4Pro working on local PC

Target: mn-55
Reaction: n,2n
Quantity: cs
OK. Search

SQL

```
select * from sig1
where (Target like 'mn-55')
  and (Reaction like 'n,2n')
```

Execute

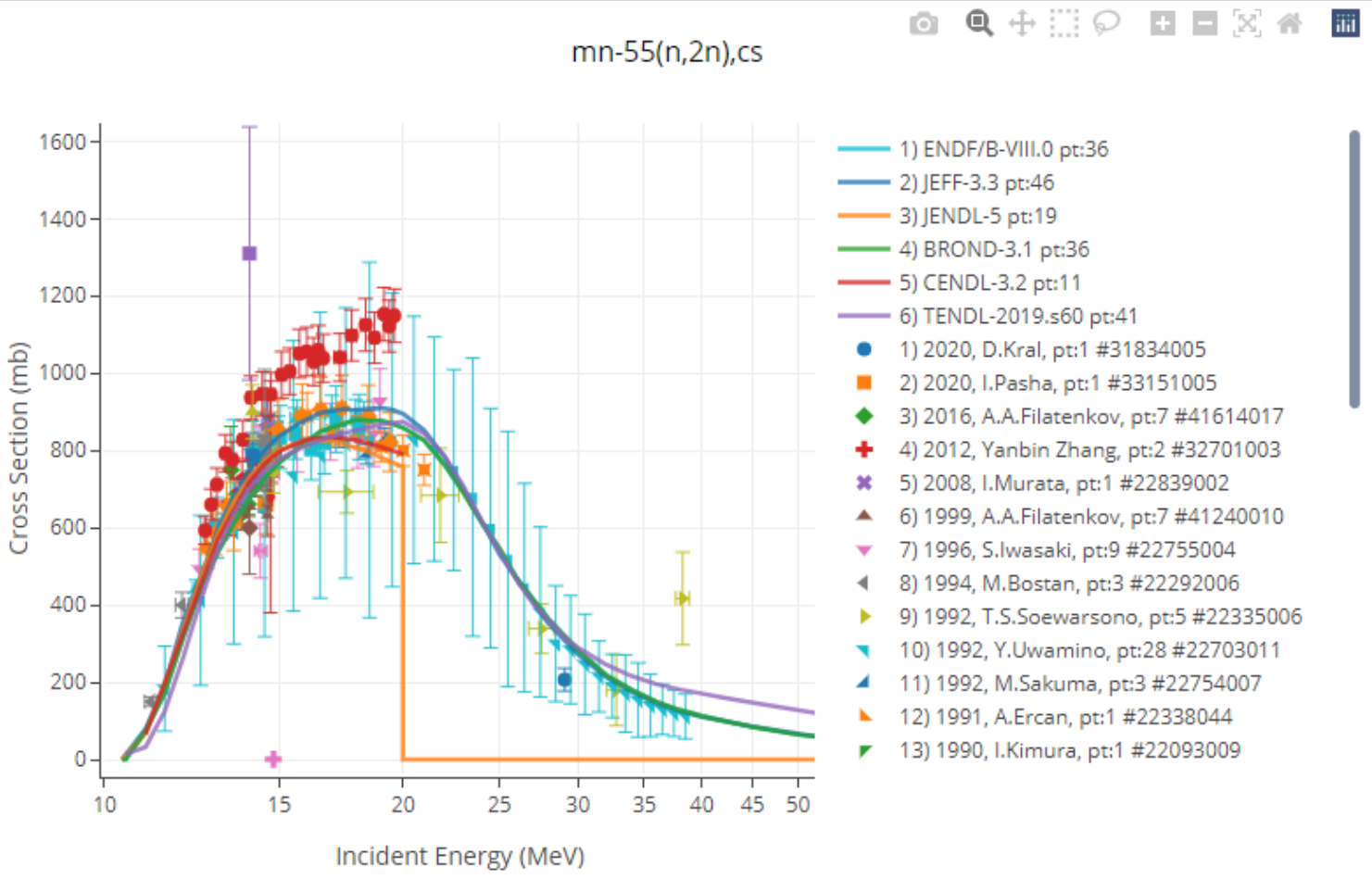
SQL-Result

Datasets

1) 2020, D.Kral, E:[29.1], pt:1, #31834005
2) 2020, I.Pasha, E:[14.54], pt:1, #33151005
3) 2016, A.A.Filatenkov, E:[13.56-14.78], pt:7, #41614017
4) 2012, Yanbin Zhang, E:[14.1-14.7], pt:2, #32701003
5) 2008, I.Murata, E:[14.2], pt:1, #22839002
6) 1999, A.A.Filatenkov, E:[13.56-14.78], pt:7, #41240010
7) 1996, S.Iwasaki, E:[12.465-18.951], pt:9, #22755004
8) 1994, M.Bostan, E:[11.14-12.85], pt:3, #22292006
9) 1992, T.S.Soewarsono, E:[17.55-38.26], pt:5, #22335006
10) 1992, Y.Uwamino, E:[11.5-38.5], pt:28, #22703011
11) 1992, M.Sakuma, E:[17.226-19.147], pt:3, #22754007
12) 1991, A.Ercan, E:[14.6], pt:1, #22338044
13) 1990, I.Kimura, E:[14.05], pt:1, #22093009
14) 1988, Y.Ikeda, E:[13.35-14.93], pt:8, #22089039
15) 1987, J.W.Meadows, E:[14.74], pt:1, #12969011
16) 1987, L.R.Greenwood, E:[14.5-14.9], pt:5, #12977008
17) 1985, B.M.Bahal, E:[14.7], pt:1, #21936010
18) 1984, M.Berrada, E:[14.6], pt:1, #30805002
19) 1980, Lu Hanlin, E:[14.58], pt:1, #30615002
20) 1980, Lu Hanlin, E:[12.37-18.26], pt:14, #30615003
21) 1979, K.Kayashima, E:[14.6], pt:1, #21300013
22) 1977, G.F.Auchampaugh, E:[14.7-21], pt:7, #12936006
23) 1976, O.Schwerer, E:[14.6], pt:1, #20811006
24) 1975, F.Deak, E:[14.7], pt:1, #30333002
25) 1974, G.N.Maslov, E:[14.6], pt:1, #40136005
26) 1973, J.Araminowicz, E:[14.6], pt:1, #30264011
27) 1971, O.A.Salnikov, E:[14.36], pt:1, #40037133
28) 1969, R.C.Barrall, E:[14.6], pt:1, #10022008
29) 1969, R.C.Barrall, E:[14.8], pt:1, #10031004
30) 1969, M.Bormann, E:[12.99-18.06], pt:8, #20835003
31) 1968, H.Vonach, E:[14.1], pt:1, #21533002
32) 1967, H.O.Menlove, E:[12.7-19.39], pt:10, #11421005
33) 1967, J.Csikai, E:[13.41], pt:1, #30033008
34) 1965, A.Paulsen, E:[12.63-19.59], pt:23, #20378004
35) 1963, B.Granger, E:[14], pt:1, #21514005
36) 1962, R.Wenusch, E:[14], pt:1, #20091003
37) 1961, J.Nix, E:[14.8], pt:1, #11684003
38) 1960, E.Weigold, E:[14.5], pt:1, #31039006
39) 1958, V.J.Ashby, E:[14.1], pt:1, #11632003

Plot

Axis x: log y: log Range x: 10 52 y: -36 1647 Size: 800 500 Repaint



What is EE-View

EE-View: experimental-evaluated data previewer presenting an additional Web interface to existing EXFOR-ENDF database system. EE-View works in a Web-browser using Html5/JavaScript and plotting package Plotly.js.

EE-View retrieves data from EXFOR/X4Pro and ENDF via AJAX using Web-API.

EE-View provides following functionality:

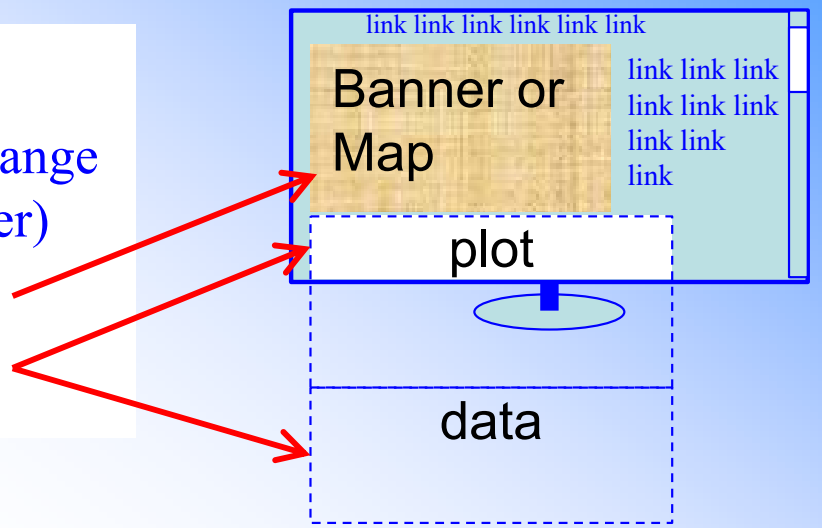
1. *Quick plot EXFOR and ENDF data by one click (few seconds)*
2. *Plot evaluated curves with error-band (MF33/MF34)*
3. *Coloured items in data selection menu indicate existing experimental and evaluated data*
4. *Selection datasets by reaction-codes and energy range*
5. *Copy/paste data to the plot*
6. *Export data to CSV format for uploading to Excel*
7. *Output plot to PNG and SVG using package Plotly.js*
8. *Implemented for cross sections and angular distributions*

EE-View Experimental-Evaluated data Viewer

1. Cross sections with drop-down choice of data: https://www-nds.iaea.org/exfor/eeview.htm
2. Cross sections with open choice of data: https://www-nds.iaea.org/exfor/eeview1.htm
3. Angular distributions: https://www-nds.iaea.org/exfor/eeview-da.htm

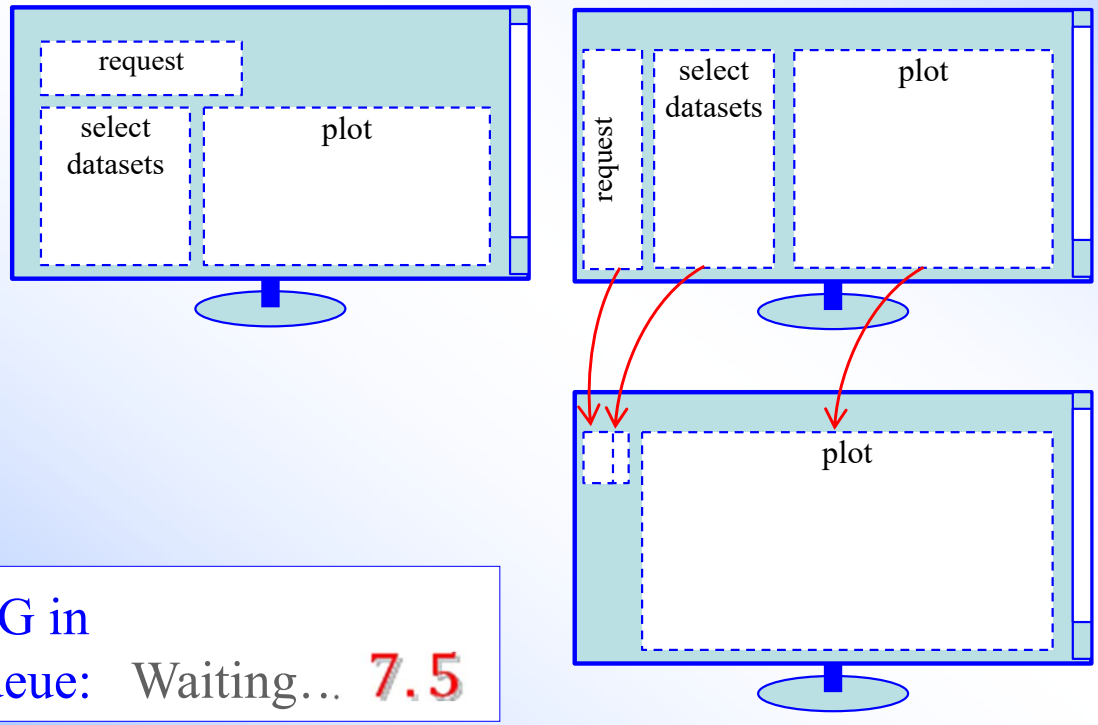
Layout

1) Typical screens: 4:3 → 16:9 (since ~2012)
2) Modern tendency: stay on the same page, change its contents on events (mouse/keyboard/ timer)
3) Today's layouts: huge banner (useless?) or select-map; click and scroll to see result



EE-View layout

1) Use modern tendency, but…
2) Try to avoid scrolling
3) Collapse/open sections maximizing plotting area (or other areas)
4) Resizable plotting area

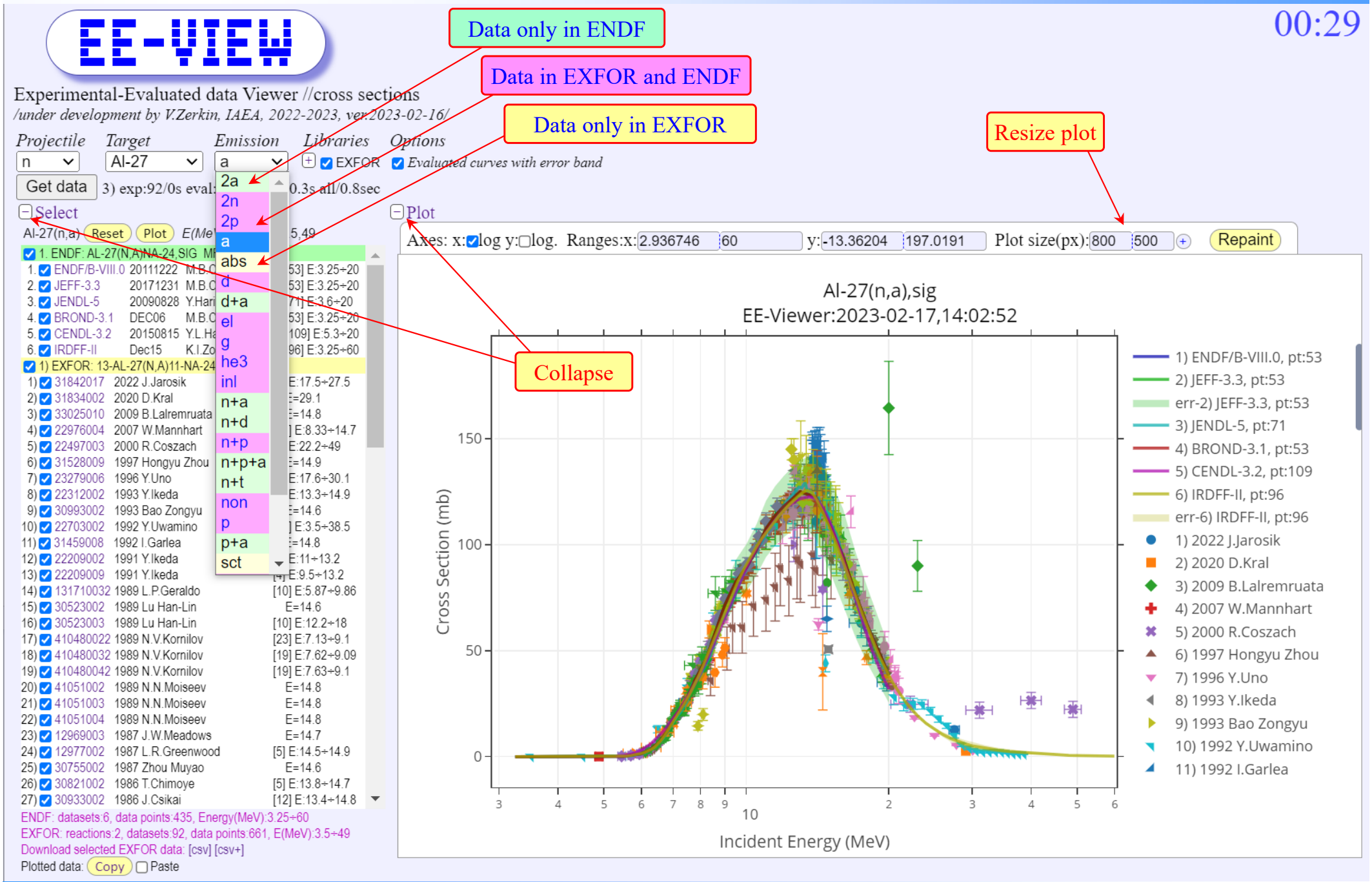


Time indication

Waiting time is indicated by animated PNG in parallel with the main JavaScript event queue: Waiting… 7.5

EE-View Experimental-Evaluated data Viewer

Cross sections



EE-View Experimental-Evaluated data Viewer

Cross sections

0.8sec

03:25

EE-VIEW

Experimental-Evaluated data Viewer //cross sections

/under development by V.Zerkin, IAEA, 2022-2023, ver.2023-02-16/

Get data | Al-27(n,a) 3) exp:92/0s eval:6/0.4s plot/0.4s all/0.8sec

Projectile:n

g ✓n p d t he3 a He-6 Li-6 Li-7

Target:Al-27

Ag-110M Ag-111 Ag-112 Ag-113 Ag-114 Ag-115 Ag-116 Ag-117 Ag-118M Al-26 Al-26M ✓Al-27 Al-CMP Al-OXI Am-240 Am-241 Am-242 Am-242M Am-243 Am-244 Am-244M Ar-0

Emission:a

2a 2n 2p ✓a abs d d+a el g he3 inl n+a n+d n+p n+p+a n+t non p p+a sct t

Select

Al-27(n,a) Reset Plot *E(MeV)min,max:* 8,18

1. ENDF: AL-27(N,A)NA-24,SIG MF:3 MT:107

1.	ENDF/B-VIII.0	20111222	M.B.Chadwick+	[53] E:3.25÷20
2.	JEFF-3.3	20171231	M.B.Chadwick+	[53] E:3.25÷20
3.	JENDL-5	20090828	Y.Harima+	[71] E:3.6÷20
4.	BROND-3.1	DEC06	M.B.Chadwick+	[53] E:3.25÷20
5.	CENDL-3.2	20150815	Y.L.Han	[109] E:5.3÷20
6.	IRDFF-II	Dec15	K.I.Zolotarev	[96] E:3.25÷60

1) EXFOR: 13-AL-27(N,A)11-NA-24,,SIG

1)	31842017	2022	J.Jarosik	[3] E:17.5÷27.5
2)	31834002	2020	D.Kral	E=29.1
3)	33025010	2009	B.Lalremruata	E=14.8
4)	22976004	2007	W.Mannhart	[28] E:8.33÷14.7
5)	22497003	2000	R.Coszach	[4] E:22.2÷49
6)	31528009	1997	Hongyu Zhou	E=14.9
7)	23279006	1996	Y.Uno	[6] E:17.6÷30.1
8)	22312002	1993	Y.Ikeda	[8] E:13.3÷14.9
9)	30993002	1993	Bao Zongyu	E=14.6
10)	22703002	1992	Y.Uwamino	[36] E:3.5÷38.5
11)	31459008	1992	I.Garlea	E=14.8
12)	22209002	1991	Y.Ikeda	[3] E:11÷13.2

Libraries

EXFOR

Options

Colors

ENDF data only

EXFOR data only

EXFOR ∪ ENDF

EXFOR ∩ ENDF

Statistics of usage: visits: 653, requests: 10

Created by V.Zerkin (v.zerkin@iaea.org), L

Database and Programming: EXFOR/X4P

Experimental Data Source: EXFOR, Netwo

Evaluated Data Source: CSEWG, WPEC, I

Libraries

EXFOR

ENDF/B-VIII.0 (USA,2018)

JEFF-3.3 (Europe,2017)

JENDL-5 (Japan,2021)

CENDL-3.2 (China,2020)

BROND-3.1 (Russia,2016)

IRDFF-II (IAEA,2019)

All other libraries

Options

Evaluated curves with error band

Colors

ENDF data only

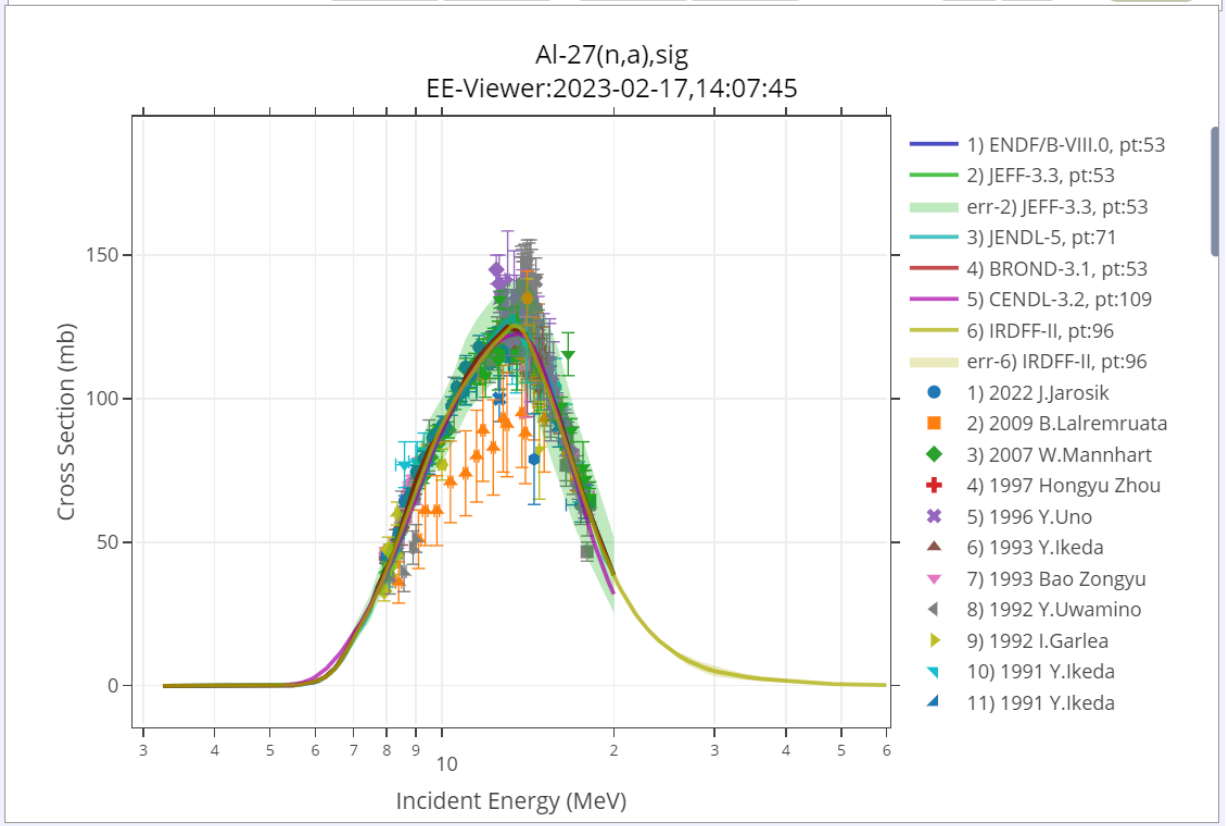
EXFOR data only

EXFOR ∪ ENDF

EXFOR ∩ ENDF

Plot

Axes: x:☑log y:☐log. Ranges:x:2.911482 60 y:-13.36204 197.0191 Plot size(px):750 500 Repaint



EE-View Experimental-Evaluated data Viewer

Angular distribution

2.7sec

04:18

EE-VIEW

Experimental-Evaluated data Viewer //angular distributions

/under development by V.Zerkin, IAEA, 2022-2023, ver.2023-02-16/

Projectile n | *Target* Mn-55 | *Emission* el | *Inc.Energy* 3.5 MeV | *Libraries* EXFOR | *Options* Evaluated curves with error band

Get data | 3) exp:80/0s eval:5/2.6s plot/0.1s all/2.7sec

Select

Mn-55(n,el) Reset Plot Ei=3.5MeV

1.	ENDF: MN-55(N,EL)MN-55-L0,DA MF:4 MT:2			
1.	ENDF/B-VIII.0	20111222	IAEA Evaluation ...	[137] Ei:3.5e6
2.	JEFF-3.3	20171231	IAEA Evaluation ...	[46] Ei:3.5e6
3.	JENDL-5	20210607	N.Iwamoto	[82] Ei:3.5e6
4.	BROND-3.1	20111222	IAEA Evaluation ...	[137] Ei:3.5e6
5.	CENDL-3.2	950817	B.S.Yu+	[74] Ei:3.5e6
	1) EXFOR: 25-MN-55(N,EL)25-MN-55,,DA			
1)	22155082	1992	A.Takahashi Ei:1.41e7	[16] An:15÷160
2)	21722038	1972	I.Fujita Ei:1.41e7	An=110
3)	20019082	1969	B.Holmqvist Ei:2.47e6	[19] An:19.9÷160
4)	20019082	1969	B.Holmqvist Ei:3.00e6	[20] An:19.9÷160
5)	20019082	1969	B.Holmqvist Ei:3.49e6	[20] An:19.9÷160
6)	20019082	1969	B.Holmqvist Ei:4.00e6	[20] An:19.9÷160
7)	20019082	1969	B.Holmqvist Ei:4.56e6	[20] An:19.9÷160
8)	20019082	1969	B.Holmqvist Ei:6.09e6	[19] An:19.9÷160
9)	20019082	1969	B.Holmqvist Ei:7.05e6	[19] An:19.9÷160
10)	20019082	1969	B.Holmqvist Ei:8.05e6	[19] An:19.9÷160
11)	11511008	1966	R.L.Becker Ei:3.20e6	[14] An:20÷150
12)	11519005	1966	S.A.Cox Ei:6.77e5	[8] An:20÷160
13)	11519005	1966	S.A.Cox Ei:6.86e5	[8] An:20÷160
14)	11519005	1966	S.A.Cox Ei:6.94e5	[8] An:20÷160
15)	11519005	1966	S.A.Cox Ei:7.03e5	[8] An:20÷160
16)	11519005	1966	S.A.Cox Ei:7.11e5	[8] An:20÷160
17)	11519005	1966	S.A.Cox Ei:7.19e5	[8] An:20÷160
18)	11519005	1966	S.A.Cox Ei:7.28e5	[8] An:20÷160
19)	11519005	1966	S.A.Cox Ei:7.36e5	[8] An:20÷160
20)	11519005	1966	S.A.Cox Ei:7.45e5	[8] An:20÷160
21)	11519005	1966	S.A.Cox Ei:7.53e5	[8] An:20÷160
22)	11519005	1966	S.A.Cox Ei:7.61e5	[8] An:20÷160
23)	11519005	1966	S.A.Cox Ei:7.70e5	[8] An:20÷160
24)	11519005	1966	S.A.Cox Ei:7.78e5	[8] An:20÷160
25)	11519005	1966	S.A.Cox Ei:7.87e5	[8] An:20÷160
26)	11519005	1966	S.A.Cox Ei:7.95e5	[8] An:20÷160
27)	11519005	1966	S.A.Cox Ei:8.03e5	[8] An:20÷160
28)	11519005	1966	S.A.Cox Ei:8.12e5	[8] An:20÷160

ENDF: datasets:5, data points:476, Energy(MeV):1.8e-4÷0.e0

EXFOR: reactions:2, datasets:80, data points:740, E(MeV):1.5e-5÷1.6e-4

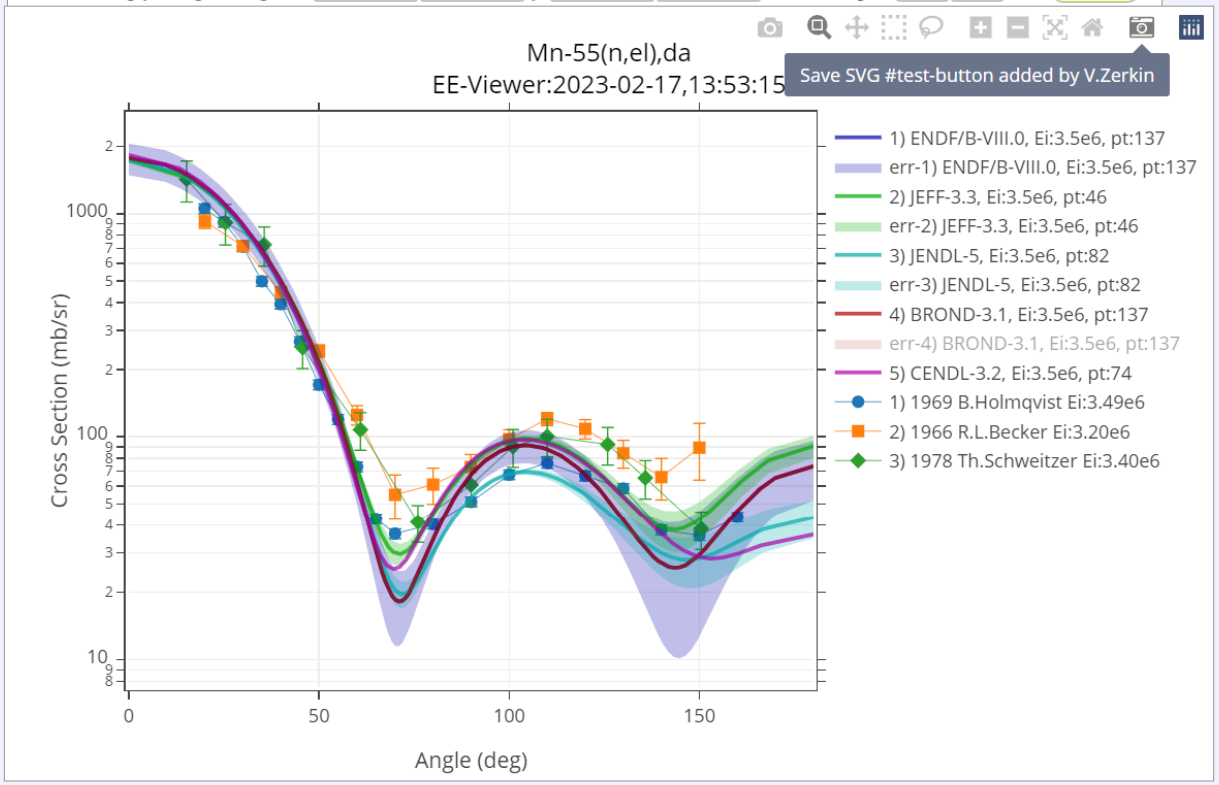
Download selected EXFOR data: [csv] [csv+]

Plotted data: Copy Paste

Plot

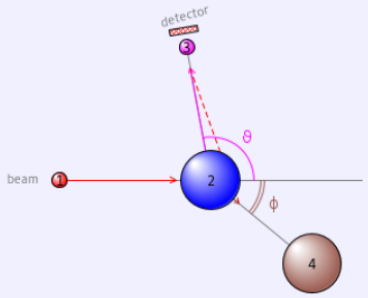
Axes: x:log y:log. Ranges:x: 0 180 y: 7.546586 2770.051 Plot size(px): 780 500 Repaint

Save SVG #test-button added by V.Zerkin



Point #9) x=100 y=97.4617 dy=9.93493 Dataset #2) 1966 R.L.Becker Ei:3.20e6

Point #9) Dataset #2) 1966 R.L.Becker Ei:3.20e6



25-MN-55(N,EL)25-MN-55,,DA Qvalue=0.0(keV)

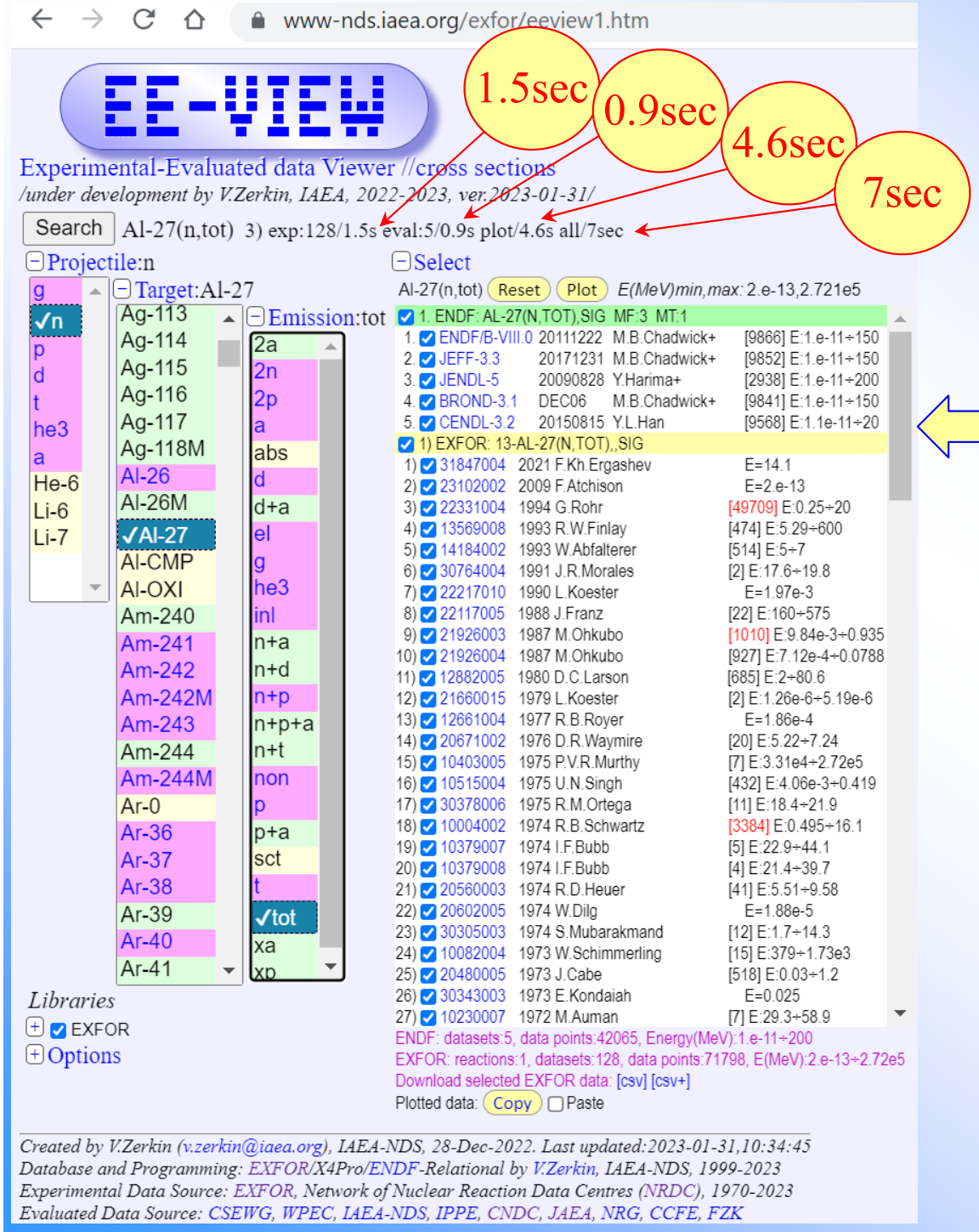
1 Projectile:	n	M_1=1.008665
2 Target:	Mn-55	M_2=54.938046
3 Scattered:	n	M_3=1.008665
4 Recoil:	Mn-55	M_4=54.938046
	Laboratory System	
E_1=3200.0	E_3=3065.0	θ=100.0° σ(θ)=97.4617 ±10.2%
E_2=0.0	E_4=134.995	φ=39.5° σ(φ)=302.871
	Center of Mass System	
E_{cm}=3142.31		
E_1'=3085.65	E_3'=3085.65	θ'=101.0° σ'(θ')=98.1023
E_2'=56.6528	E_4'=56.6528	φ'=79.0° σ'(φ')=98.1023

Units: M:(amu); E:(keV); σ:(mb/sr)

Statistics of usage: visits: 652, requests: 998, since 01-Feb-2023

Created by V.Zerkin (v.zerkin@iaea.org), IAEA-NDS, 28-Dec-2022. Last updated:2023-02-16,12:01:53
Database and Programming: EXFOR/X4Pro/ENDF-Relational by V.Zerkin, IAEA-NDS, 1999-2023
Experimental Data Source: EXFOR, Network of Nuclear Reaction Data Centres (NRDC), 1970-2023
Evaluated Data Source: CSEWG, WPEC, IAEA-NDS, IPPE, CNDC, JAEA, NRG, CCFE, FZK

EE-View performance



Stress-tests on cloud servers

Al-27(n,tot)

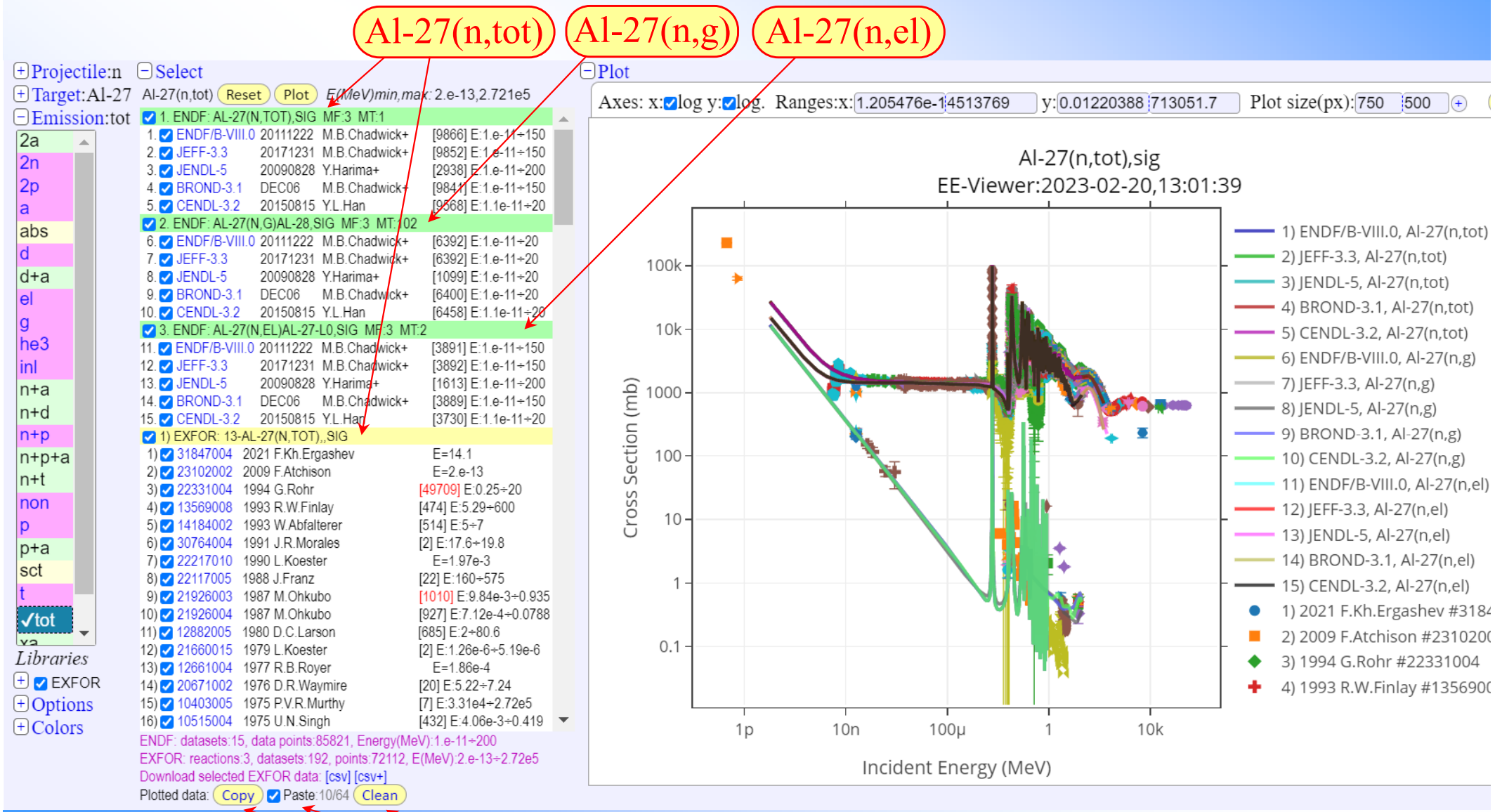
#	Operation	Time
1.	Retrieve EXFOR data datasets: 128, points: 71,798	1.5 sec
2.	Retrieve ENDF data datasets: 5, points: 42,065	0.9 sec
3.	Preparing data for plot (all)	4.6 sec
	All operations above:	7.0 sec
4.	Plot by Plotly.js	4.3 sec
	Total:	**10.3 sec**

U-235(n,f)

#	Operation	Time
1.	Retrieve EXFOR data datasets: 196, points: 133,591	3.1 sec
2.	Retrieve ENDF data datasets: 6, points: 273,311	2.8 sec
3.	Preparing data for plot (all)	7.6 sec
	All operations above:	13.4 sec
4.	Plot by Plotly.js	4.2 sec
	Total:	**17.6 sec**

Multiple Copy/Paste

Plotted data can be stored in the local “clipboard” by command [Copy] and later added to another plot by using Checkbox [Paste]. The content of local “clipboard” can be used several times storing data from current plot accumulating data from several reactions. Data selection Checkboxes can be used in usual way. Button [Clean] should be used to empty “clipboard”.

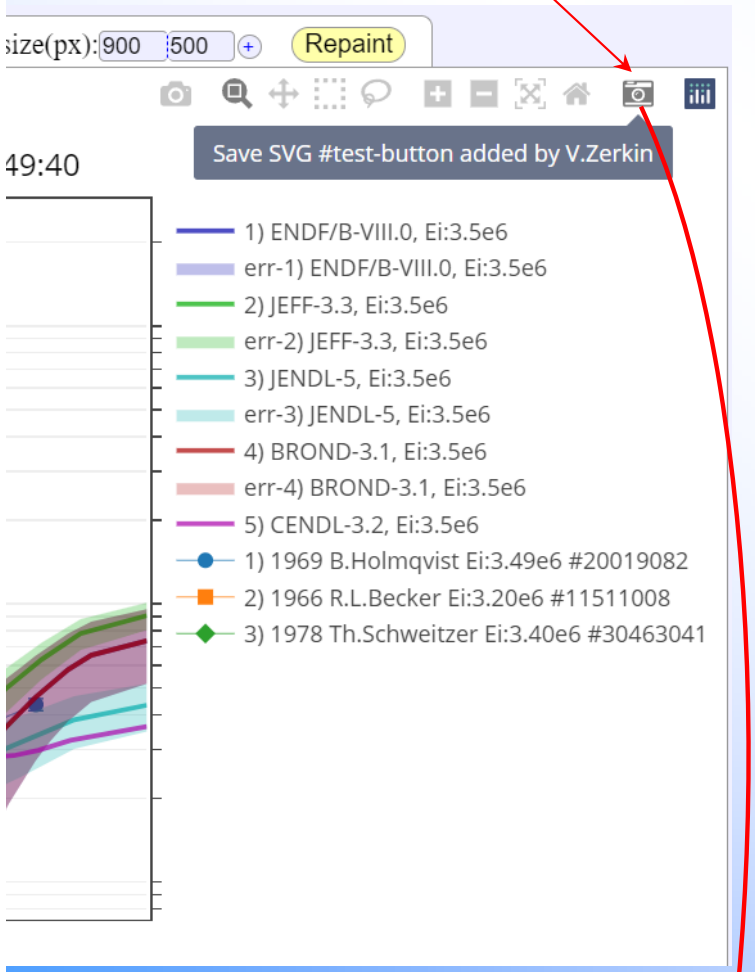


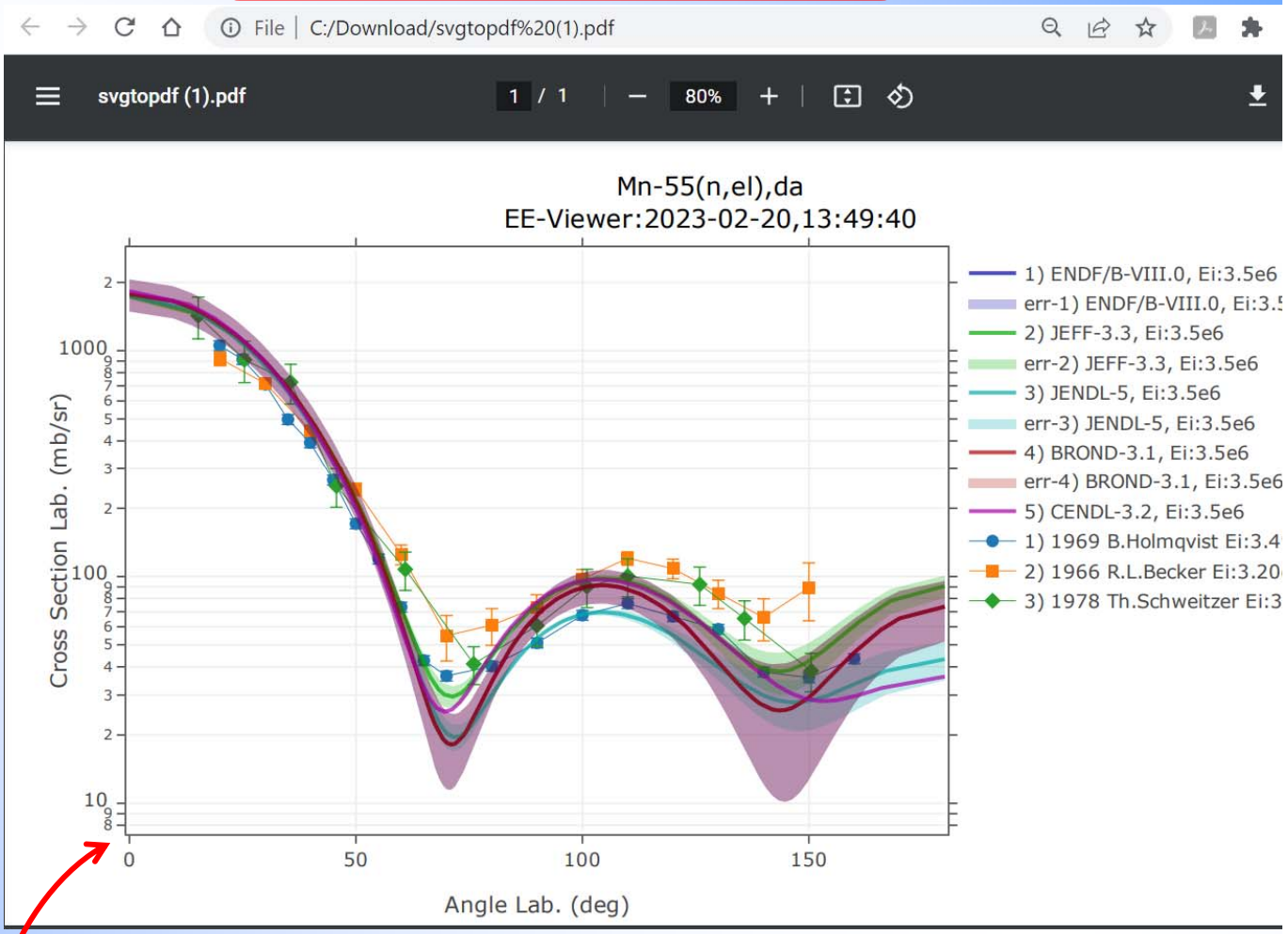
High quality graphics

A button [Save SVG], added to Plotly command panel, allows to store current plot in SVG (Scalable Vector Graphics) formatted file which can be converted to PDF or used by Web Browsers and other applications.

Save SVG

SVG converted to PDF online





Concluding remarks

1. EE-View: experimental-evaluated data previewer.
   The main purpose: quickly find and plot nuclear reactions data

2. EE-View is implemented using Html-5/JavaScript and Plotly.js on client side and retrieving data from X4Pro and ENDF via AJAX using Web-API

3. EE-View provides following functionality:
   a) quick plot EXFOR and ENDF data with one click in a few seconds
   b) plot evaluated curves with error-band (MF33/MF34)
   c) coloured items in data selection menu indicate data presence in the databases
   d) selection datasets by reaction-codes and energy range
   e) multiple copy/paste data to the plot
   f) export data to CSV format for uploading to Excel
   g) output plot to PNG and SVG using package Plotly.js
   h) implemented for cross sections and angular distributions

4. Performance tests give good results

5. Plan for 2023: make it public, receive feedback, continue development

Thank you.