

EXFOR PDFs archiving improvements

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Objective

Propose an improvement to the current process of the EXFOR PDF database update

Value proposition:

- + Usability
- + Accessibility
- + Maintainability
- + Security

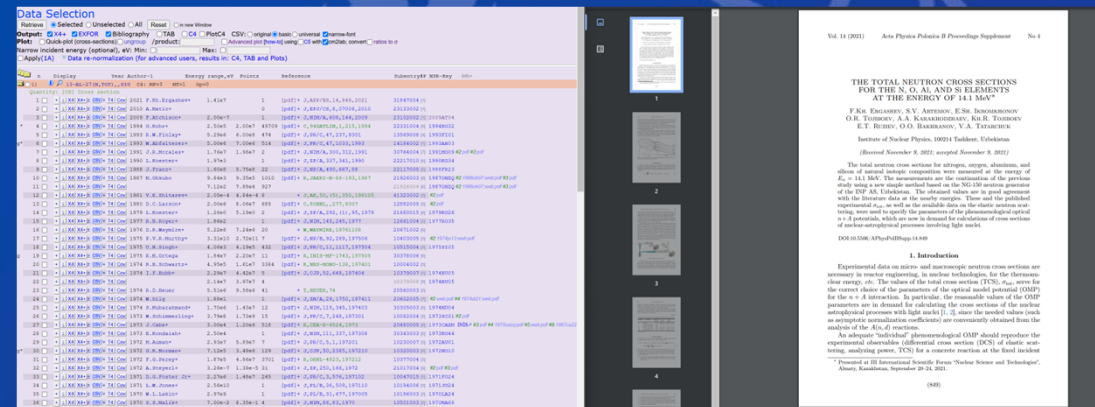
Introduction

The EXFOR web retrieval application currently offers, to a very restricted set of users, the display of publications of various types such as journals, conferences, reports, thesis, etc., in PDF format.

This is a useful feature for EXFOR compilers and some evaluators to check and compare the data.

Sources of the publications:

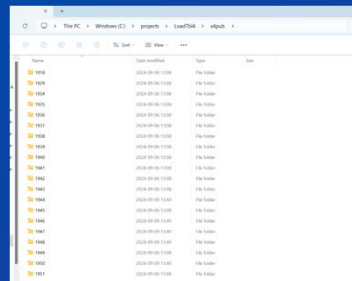
- NSR
- EXFOR



The screenshot displays the EXFOR Data Selection interface. On the left, a table lists various publications with columns for 'Energy group', 'Reference', and 'Subentry'. The table includes entries for different elements and energy groups, such as '1.0 1.00 NSR 0509 14.000 2021 F.R. Espinosa' and '2.0 1.00 NSR 0509 14.000 2010 A. Amelin'. On the right, a preview of a document is shown, titled 'THE TOTAL NEUTRON CROSS SECTIONS FOR THE N, O, AL AND Si ELEMENTS AT THE ENERGY OF 14.1 MeV'. The document includes the authors' names (F.R. Espinosa, S.V. Antoshin, E.S. Inozemtsov, O.R. Todorov, A.S. Kabanovskiy, R.G. Todorov, E.T. Belyi, O.O. Bakharev, V.A. Tatarskiy) and a detailed introduction section. The introduction discusses the experimental data on micro- and macroscopic neutron cross sections used for engineering in nuclear technology, the importance of the optical model potential (OMP) parameters, and the use of the optical model potential (OMP) to calculate the cross sections of the nuclear target nucleus with light nuclei. It also mentions the use of the optical model potential (OMP) to calculate the cross sections of the nuclear target nucleus with light nuclei.

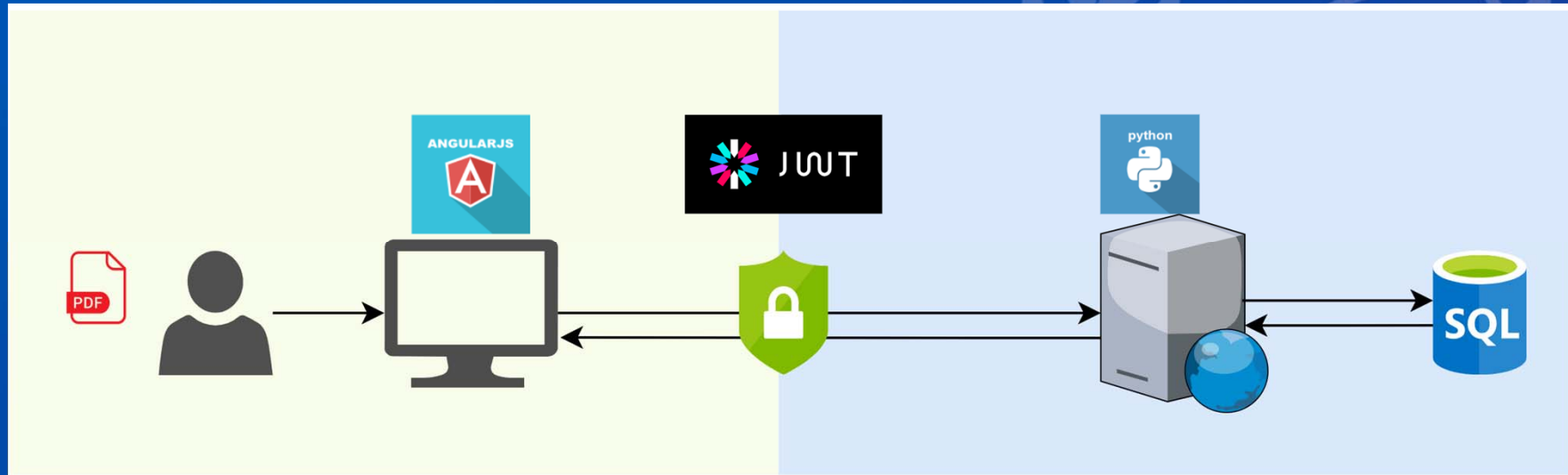
Current problem – update of the internal PDF database

- Some PDFs are updated while others are not.
- Depends on user folders and OS.
- Several scripts involved.
- No version control.
- Low security.
- Not ideal: PDF blobs are stored on the database
200.57 GB



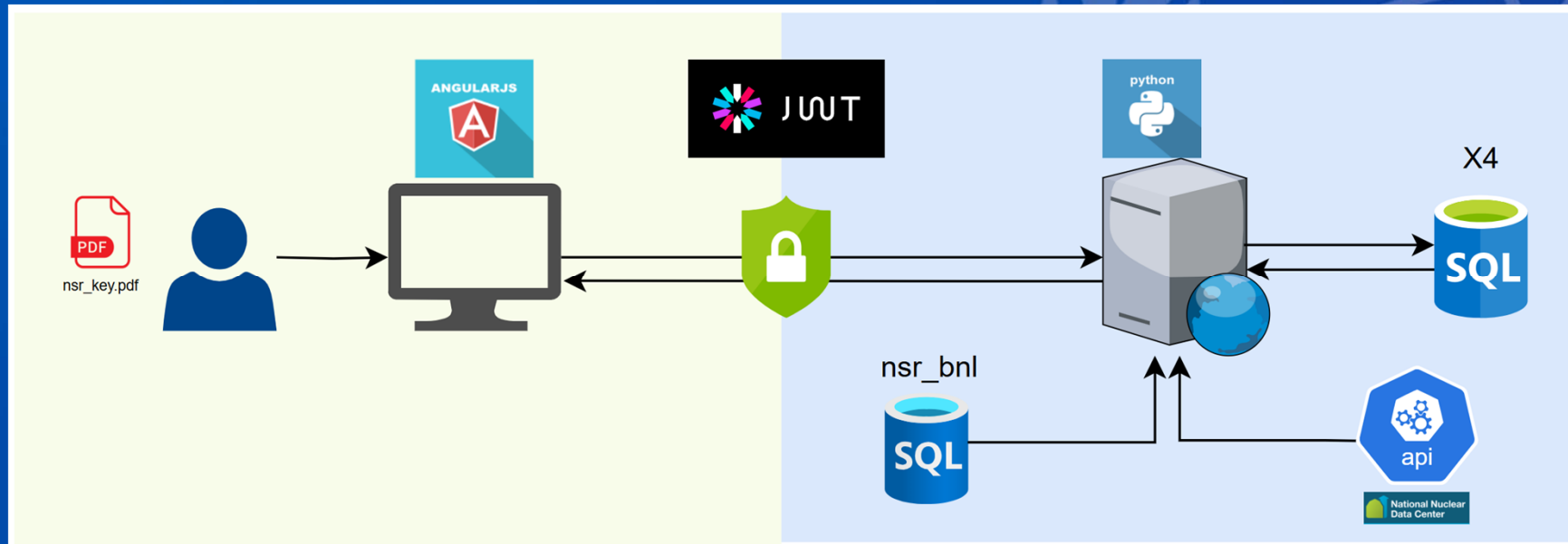
Proposed solution for current system – EXFOR PDFs

- Angular frontend
- JWT Authentication
- Python backend – APIs



Proposed solution for current system – NSR PDFs

- Angular frontend
- JWT Authentication
- Python backend – APIs





IAEA

International Atomic Energy Agency
Atoms for Peace and Development

Proof of concept – EXFOR PDFs

EXFOR NSR

EXFOR PDF library update

Entry number

Get reference data

Username

Password

Login Cancel

Entry number

Get reference data

Reference: **J,NP,89,(3),481,196612** ⇄ **J,NP,89,481,1966**

Title Absolute cross sections and excitation functions for a-particle-induced reactions of $\{^{+165}\text{Ho}, ^{+164}\text{Er}, ^{+166}\text{Er}$ and $\{^{+167}\text{Er}$

Authors G.C.Martin, Jr., R.C.Pilger, Jr.


Type J ⇄ J **Code** J,NP ⇄ J,NP **NSR key** 1966MA69 **DOI** 10.1016/0029-5582(66)90925-4 **Year** 1966

File uploaded **Upload date** 2024-12-02

Upload file

+ Choose Upload X Cancel

Drag and drop files to upload



+ Copy



IAEA
International Atomic Energy Agency
Atoms for Peace and Development

PDF update

Data Selection

Retrieved: 0 Selected: 0 Unselected: All Reset In new Window

Output: EXFOR Bibliography TAB PlotC4 CSV: original@basic universal narrow-fort

Plot: Quick-plot (cross-sections) Legend / Product: Advanced plot (download using US and Contribute) convert ratios to 0

Narrow incident energy (optional), eV: Min: Max:

Apply(4) Data re-normalization (for advanced users, results in: C4, TAB and Plots)

Display	Year	Author-1	Energy range, eV	Points	Reference	Subentry#	REF-key
1	67-80	161A,201-69-105-167,103	Q184V1=16106,101, 041	MP16	Q184V1=16106,101, 041	MP16	Q184V1=16106,101, 041
2	67-80	161A,201-69-105-167,103	Q184V1=16106,101, 041	MP16	Q184V1=16106,101, 041	MP16	Q184V1=16106,101, 041
3	67-80	161A,201-69-105-167,103	Q184V1=16106,101, 041	MP16	Q184V1=16106,101, 041	MP16	Q184V1=16106,101, 041
4	67-80	161A,201-69-105-167,103	Q184V1=16106,101, 041	MP16	Q184V1=16106,101, 041	MP16	Q184V1=16106,101, 041

List of Datasets: [list.csv]

Automatic data re-normalization is available

Show Summary (with code explanation, links to dependent data, etc.)

Extended EXFOR (original file with code explanation, links to Web Journals)



Data Selection

Retrieved: 0 Selected: 0 Unselected: All Reset In new Window

Output: EXFOR Bibliography TAB PlotC4 CSV: original@basic universal narrow-fort

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3	67-80	161A,201-69-105-167,103	Q184V1=16106,101, 041	MP16	Q184V1=16106,101, 041	MP16	Q184V1=16106,101, 041
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ABSOLUTE CROSS SECTIONS AND EXCITATION FUNCTIONS FOR α -PARTICLE-INDUCED REACTIONS OF ^{238}U , ^{235}U AND ^{232}Th

G. C. MARTIN, J. L. AND R. C. PLEGER, JR.
University of Notre Dame, Notre Dame, Indiana, U.S.A.¹

Received 19 June 1966

Abstract: Absolute cross sections and excitation functions for α -induced reactions have been measured from 16 to 80 MeV by activation and delayed neutron techniques. The following reactions were measured: $^{238}\text{U}(\alpha, n)^{241}\text{Pu}$, $^{238}\text{U}(\alpha, p)^{239}\text{Pu}$, $^{238}\text{U}(\alpha, d)^{240}\text{Pu}$, $^{238}\text{U}(\alpha, t)^{241}\text{Pu}$, $^{238}\text{U}(\alpha, ^3\text{He})^{241}\text{Pu}$, $^{238}\text{U}(\alpha, ^4\text{He})^{242}\text{Pu}$, $^{235}\text{U}(\alpha, n)^{238}\text{Pu}$, $^{235}\text{U}(\alpha, p)^{234}\text{Pu}$, $^{235}\text{U}(\alpha, d)^{236}\text{Pu}$, $^{235}\text{U}(\alpha, t)^{236}\text{Pu}$, $^{235}\text{U}(\alpha, ^3\text{He})^{236}\text{Pu}$, $^{235}\text{U}(\alpha, ^4\text{He})^{237}\text{Pu}$, $^{232}\text{Th}(\alpha, n)^{235}\text{Pa}$, $^{232}\text{Th}(\alpha, p)^{231}\text{Pa}$, $^{232}\text{Th}(\alpha, d)^{233}\text{Pa}$, $^{232}\text{Th}(\alpha, t)^{233}\text{Pa}$, $^{232}\text{Th}(\alpha, ^3\text{He})^{233}\text{Pa}$, and $^{232}\text{Th}(\alpha, ^4\text{He})^{234}\text{Pa}$.

1. Introduction

Data concerning determinations of absolute cross sections for α -induced nuclear reactions in the near-threshold region have been very scarce. In 1949 Wilkinson and Hicks¹ produced and identified radio-isotopes of thallium, estimating cross sections for α -particle reactions with bismuth for three bombarding energies. The absolute values of the cross sections, however, were in considerable error on account of the lack of knowledge of the decay schemes and half-lives of the radio-isotopes. Shirley *et al.*² gave excitation functions for α -induced reactions on ^{238}U , but it was not possible to calculate absolute cross sections because of lack of knowledge of the detailed decay schemes of ^{238}U and ^{234}Th and of the half-life of ^{234}mPa . Grover³ also gave relative excitation functions of various products in the bombardment of ^{238}U with helium ions. Haller⁴ determined some $^{238}\text{U}(\alpha, n)^{241}\text{Pu}$ and $^{238}\text{U}(\alpha, p)^{239}\text{Pu}$ cross sections for α particles of 19 MeV and 600 mb at 27 MeV for the (x, n) and (x, p) reactions, respectively. They obtained peak cross sections of approximately 40 mb at 19 MeV and 600 mb at 27 MeV for the (x, n) and (x, p) reactions, respectively.

¹ Now at Valletta Atomic Laboratory, Pinerolo, California, U.S.A.
² Now supported by the U.S. Atomic Energy Commission.

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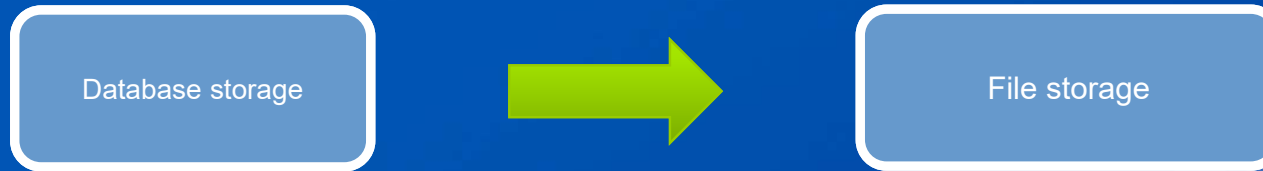
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Foreseen advantages

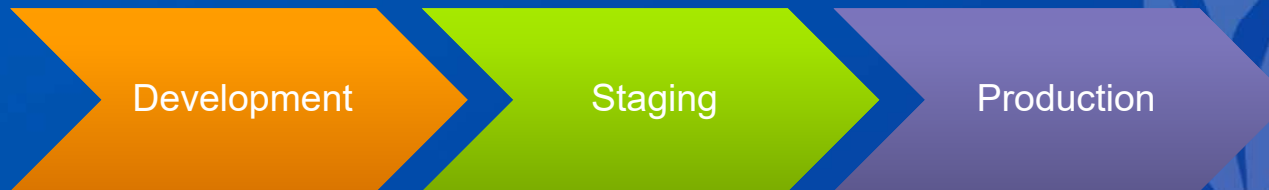
- Clearer and friendlier user process
- Reduction of the time it takes to update a PDF
- Internal web access
- Increased level of security
- Improved maintainability of code
- **Reduce database size**

Next steps

- Change storage



- Improve pipeline for the propagation of updates



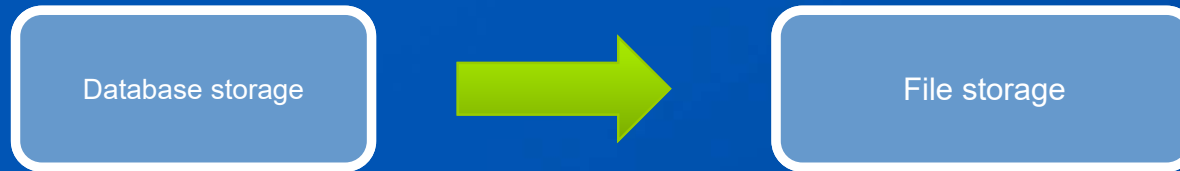
- File versioning and traceability



Custom versioning using database tables

* To be discussed with the team...

Change of storage



- Download current PDFs from exfor table (consider the current binary obfuscation)
- Make an inventory of references and PDFs
- Clean duplicates or any other unused files
- Create file reference / metadata table
- Create folder in file system
- Create global parameter for folder (could be a table for multiple folders / folder versions)
- Store PDFs in folder
- Populate new table with file references

* To be discussed with the team...



IAEA

International Atomic Energy Agency
Atoms for Peace and Development

Thank you!

