

NRDC Meeting OECD-NEA, Paris, April 16-19, 2012

NNDC report to NRDC

M. Herman
B. Pritychenko
S. Hlavac
O. Schwerer
S. Dunaeva

The logo for Brookhaven National Laboratory, featuring a stylized particle track above the text "BROOKHAVEN NATIONAL LABORATORY".
BROOKHAVEN
NATIONAL LABORATORY

a passion for discovery



U.S. DEPARTMENT OF
ENERGY

Office of
Science

Overview of EXFOR activities at NNDC

EXFOR/CSISRS NNDC team

- B. Pritychenko (BNL staff)
- S. Hlavac (long term contractor, SAS Bratislava)
- O. Schwerrer (long term contractor, CR Vienna)
- S. Dunaeva (short term contractor, CR Sarov)

Distribution of work

- Compilation by Stanislav Hlavac & Boris Pritychenko
- Internal checking by Otto Schwerer
- NNDC project management by Boris Pritychenko
- Correction of old entries by Otto Schwerer and Svetlana Dunaeva

New compilations mainly papers published in 2011/12

New NNDC EXFOR database manager

- NSR database Manager since 2009
- NNDC Webmaster 2004-2012
- Joined NNDC in 2003
- Ph.D. Physics, Michigan State Uni., 2000
 - Radioactive Nuclear Beams, Inverse kinematics
- 1991-1994 Visiting Scientists, UC Berkeley
 - Particle astrophysics, neutron shielding
- 1985-1991 Staff Scientists, Institute for Nuclear Research, Moscow, 117312
 - Search for rare nuclear physics processes, detector development



Compilation flow

- Compilation by SH & BP, contact with authors
- Internal checking by OS, first iteration
- In case of unusual or new data type contact to NDS (N.Otsuka) and/or submission of CP memo (OS)
- Submission of Prelim
- Reply to feedback on Prelim, corrections, submission of final TRANS

Entries in TRANS files submitted since NRDC meeting in Vienna, May 2011

Neutron-induced reactions

TRANS	New data		Corrected data		
	Entries	Subs	Entries	Subs	new
1371	5	30	3	4	1
1372			13	28	
1373	4	18	5	14	39
1374			28	254	
1375	2	7	9	30	
1376	6	20	3	10	
1377			20	82	
1378*	8*	-	5*	-	
subtotal	17	75	81 (86*)	422	40

New compilations are compilations of recent data as well as data from older papers, not yet included in EXFOR

New in corrected data are subentries with new data inserted into old entries

Submitted prelims (*) are shown on white background and not included in the total count

In EXFOR Web Interface: 9 new

Entries in TRANS files submitted since NRDC meeting in Vienna, May 2011

Charged-particle induced reactions

TRANS	New data		Corrected data		
	Entries	Subs	Entries	Subs	New
C106	5	29	1	2	
C107			17	52	
C108	16	97	1	16	
C109	9	56	1		4
C110			16	20	
C111	7	27	2	8	
C112	12	76	9	15	
C113			31	158	
C114			28	99	
C115*	15*	-			
T022*			24*	-	
subtotal	49 (64*)	285	106 (130*)	370	4

In EXFOR Web Interface: 34 new

Entries in TRANS files submitted since NRDC meeting in Vienna, May 2011

Photon-induced reactions

TRANS	New data		Corrected data		
	Entries	Subs	Entries	Subs	New
L015	6	19	3	5	
L016	2	5	10	23	
L017	4	2	4	8	
L018*	5*	-			
Subtotal	12 (17*)	26	17	36	

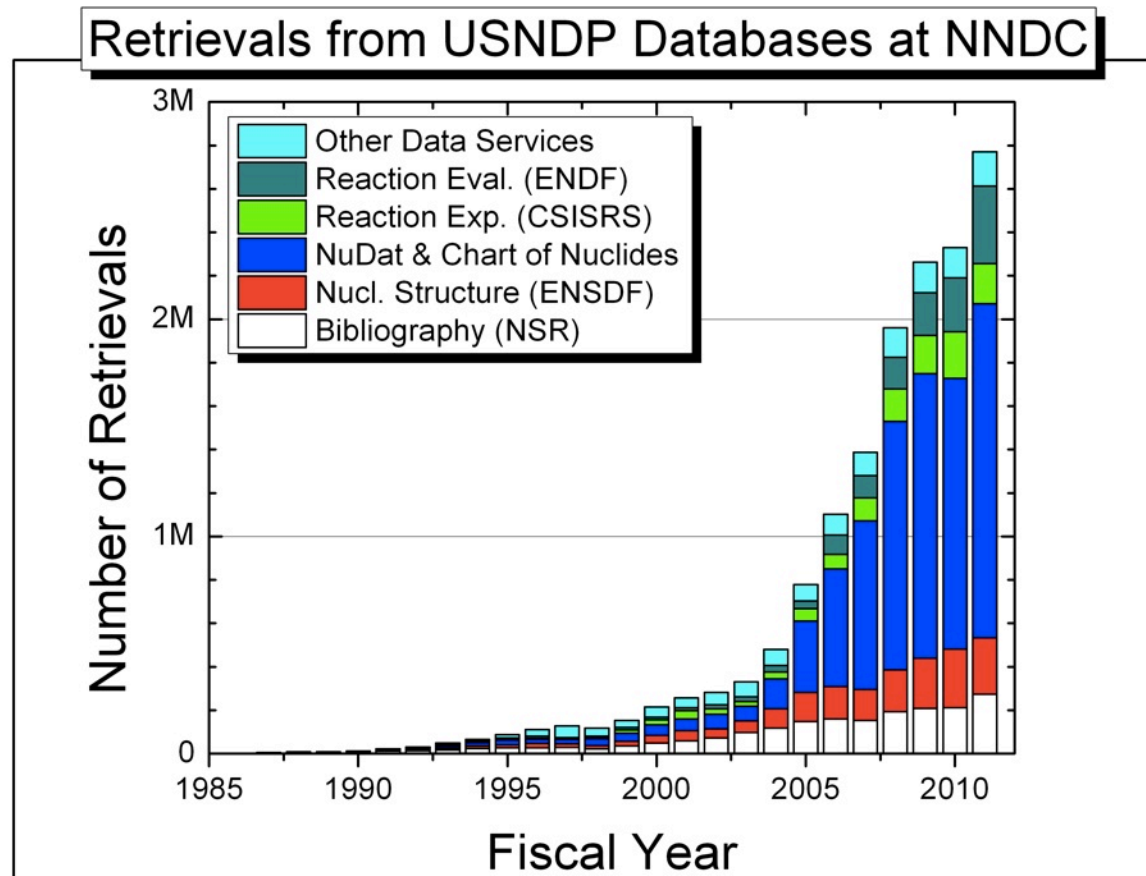
In EXFOR Web Interface: 4 new

Summary of NNDC EXFOR activities

Incident particle	Total no. of compilations				
	New data		Corrected data		
	Entries	Subs	Entries	Subs	New
neutrons	17	75	81	422	40
charged particles	51	285	106	374	4
photons	12	12	12	12	
TOTAL	80	389	191	804	44

NNDC EXFOR Web

- Support and maintenance by B. Pritychenko & V. Zerkin
- **183,562** Web retrievals in FY 2011



EXFOR & NSR integration

- CINDA is no longer supported
- NSR is the prime bibliographical database and complimentary to EXFOR source of information
- NSR/EXFOR Web integration example:

2005EG01 Nucl.Instrum.Methods Phys.Res. A545, 296 (2005)

A.I.Egorov, R.I.Krutova, Yu.E.Loginov, S.Eh.Malyutenkova

Measurement of thermal neutron radiative capture cross-sections of the ^{14}N and ^{19}F by in-beam γ -spectroscopy method with reactor neutrons

NUCLEAR REACTIONS ^{14}N , $^{19}\text{F}(n, \gamma)$, E=thermal; measured E_γ , I_γ , capture σ .

doi: 10.1016/j.nima.2005.01.315

Data from this article have been entered in the EXFOR database. For more information, access X4 dataset41463

EXFOR & NSR comparison

- NSR is a source of raw bibliographical data
- Presently ATOMKI* is using EXFOR for the p-process stellar nucleosynthesis data mining
- Compare # of papers per reaction in both databases:

Reaction	EXFOR	NSR
p, γ	396	2162
p,n	666	2571
p, α	337	1031
α , γ	144	522
α ,n	343	1321
α ,p	166	848

Table 4. Total number of p-process reaction entries in EXFOR (<http://www-nds.iaea.org/exfor>) and NSR (<http://www.nndc.bnl.gov/nsr>) databases as of August 2011.

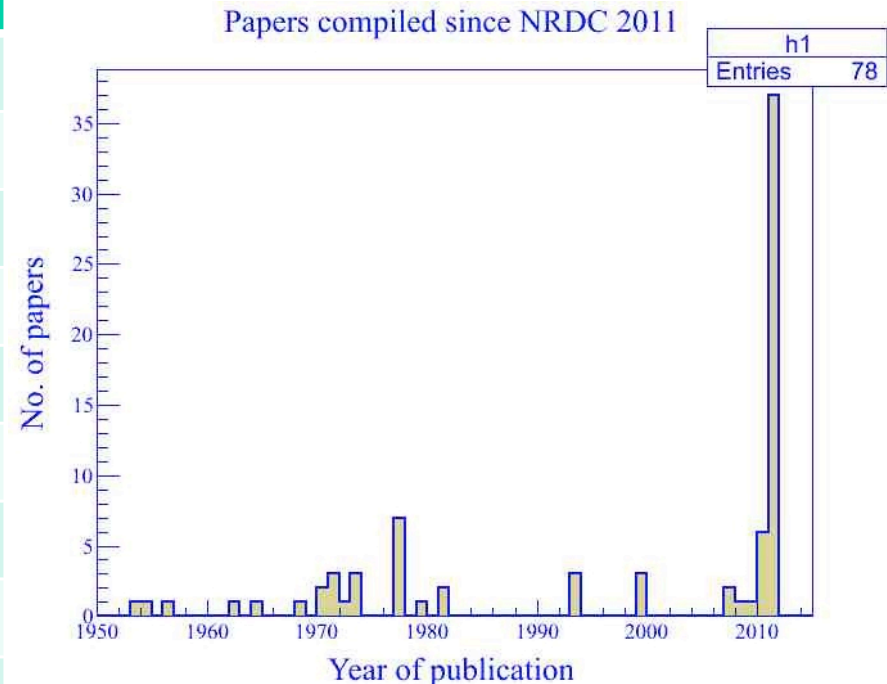
- **NSR could be used to find missing data for EXFOR**
- Szücs, T.; Dillmann, I.; Plag, R. & Fülöp, Zs. (2010). The new p-process database of KADoNiS. Proceedings of 11th Symposium on Nuclei in the Cosmos, NIC XI PoS(NIC-XI)247, Heidelberg, Germany, July 19-23, 2010, Proceedings of Science, 2010.

Statistics of newly compiled EXFOR entries

Distribution of data sources

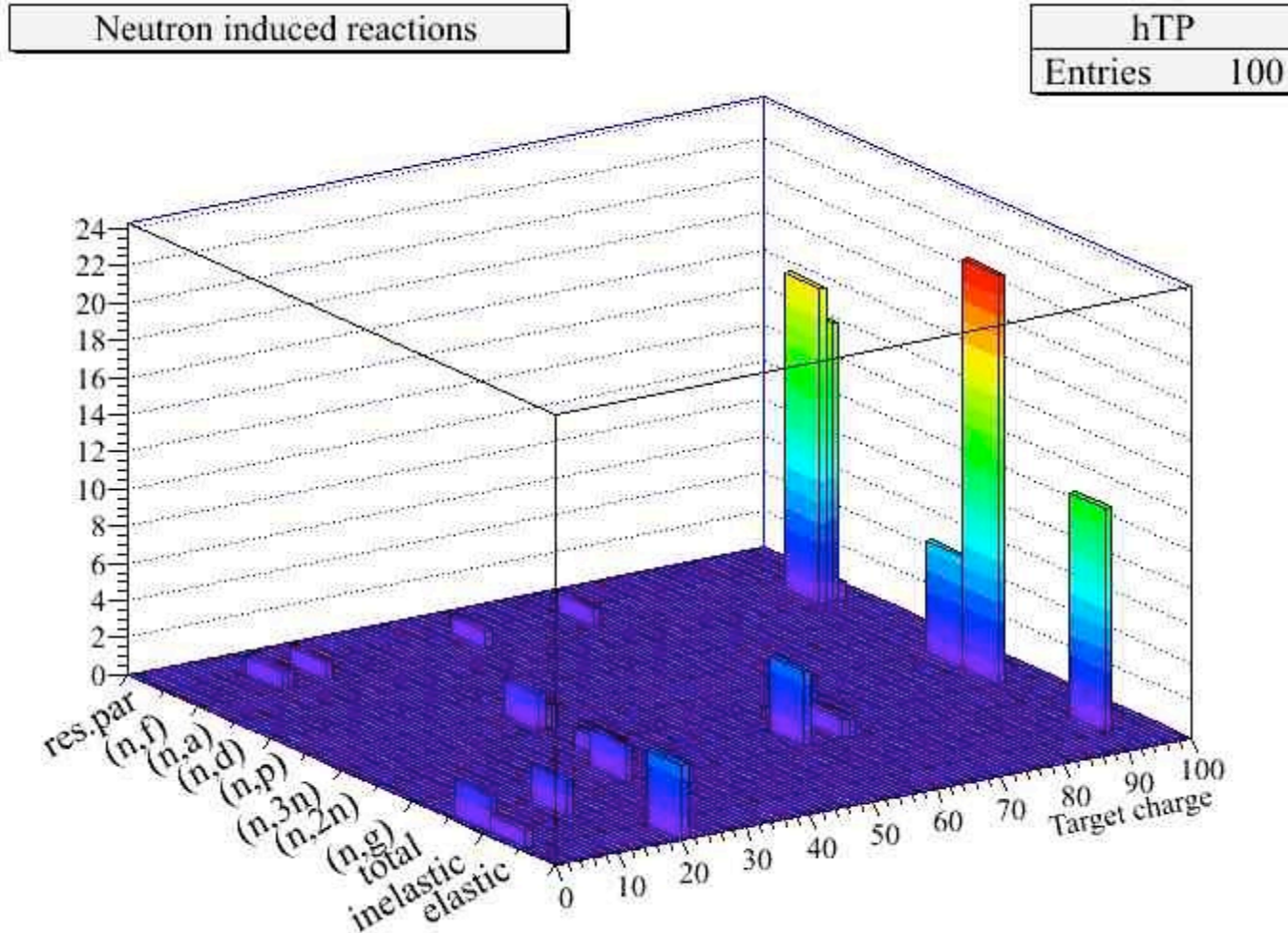
Source	No of papers
Physical Review/C	50
Physical Review Letters	7
Nuclear Instr. Methods A/B	7
Medical Physics	6
Nuclear Physics, A	3
Physical Review	2
Laboratory reports	1
Conference Proceedings	1
Other	1

Publication year of compiled data

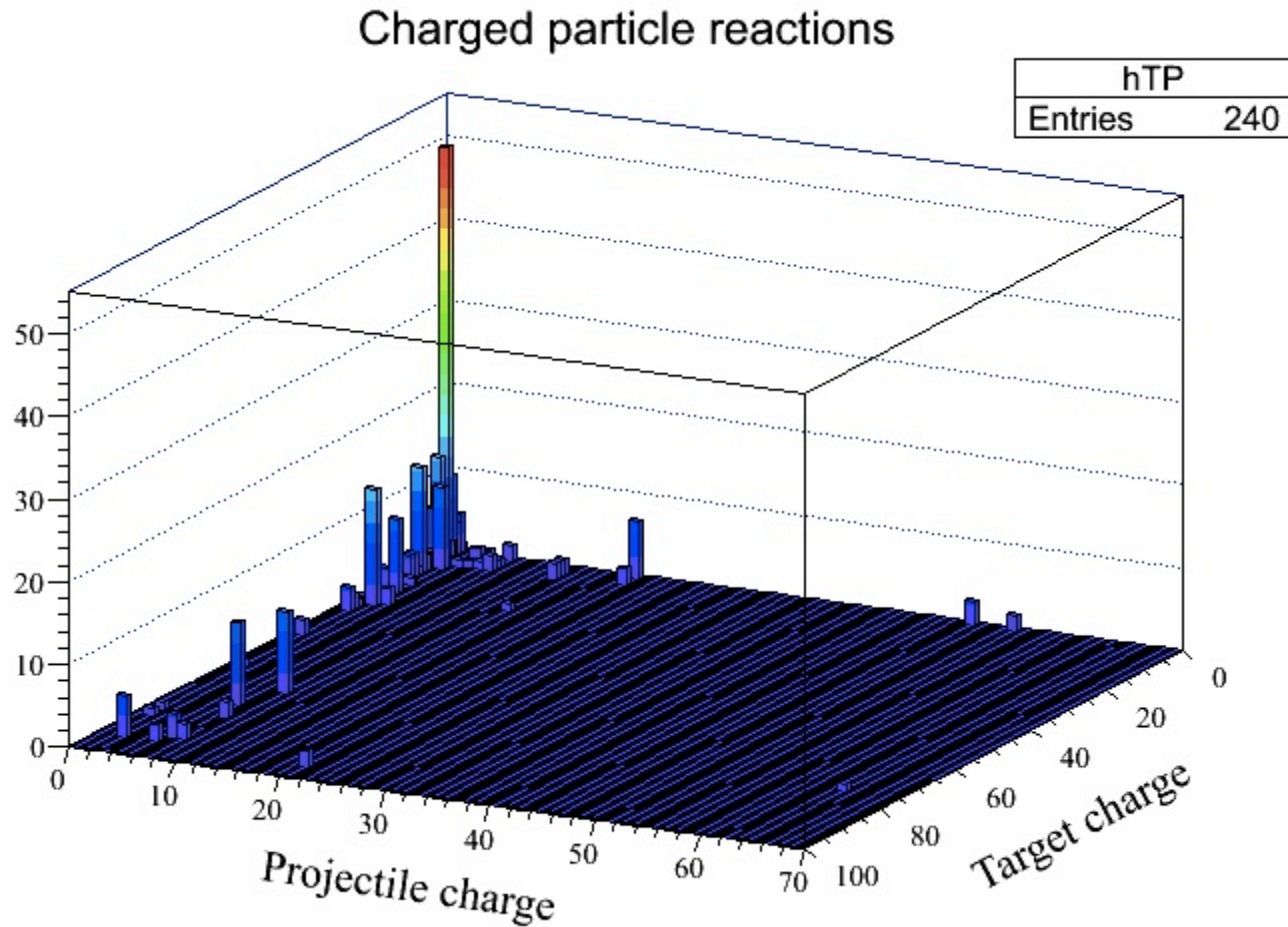


Statistics of compiled EXFOR entries

Target distribution and reaction type in neutron induced reactions



Distribution of targets and projectiles in CP reactions



Building electronic database

(S. Dunaeva at BNL)

- Over 4500 NNDC archive folders (Entries: 10001 – 10799; 10961 – 14172; C0001 – C1421) checked; numerical data and letters from authors scanned (~**3000** files).
- 583 NNDC archive folders (Entries: 10800 – 10960; P0001 – P0148; T0001 – T0275) checked; numerical data and letters from authors scanned (**272** files)
- All found mistakes are registered and will be corrected in two months
- **1475** journal articles and **900** reports (full report or part of annual Lab report) were scanned.

Entry number	10001 - 10999	11000 - 11999	12000 - 12999	13000 - 13999	14000 - 14154	C0001 - C1565	L0001 - L0135	T0001 - T0255
Number of pdf-files	769	557	474	363	14	902	0	96

Conclusions

- EXFOR activities at BNL have been strengthened
- Compilation is almost current for the major journals
- Some backlog regards conferences and reports
- Lot of corrections to the old entries have been done
- Moving towards eliminating paper library
- NNDC strongly supports the new XML format