Analysis of EXFOR compilation statistics for new articles (A2) S. Dunaeva

NRDC-2025 Technical Meeting (17-20 June 2025, Madrid, Spain)



Pavel Oblozinsky on the NRDC meeting in 2005 said that if the EXFOR database includes less than 80-90% of published articles related to the area of compilation, such a database becomes useless for scientific and applied purposes.

Speeding up Compilation of new publications

1.For neutron data,*the responsible centers should inform NDS about their compilation plans.*

2. For CPND, the reference has to be booked for compilation by the responsible Center within one month after publication (or after the center was informed by another center covering the particular journal).

3.

4. The references relevant to EXFOR have to be included in EXFOR within six months after publication.

5. After this period, NDS will take the responsibility for compilation of such papers (or assign it to another center).

(from <u>https://nds.iaea.org/publications/indc/indc-nds-0480.pdf</u>, p.28)



Available online at www.sciencedirect.com

ScienceDirect

Nuclear Data Sheets 120 (2014) 272-276

Nuclear Data Sheets

www.elsevier.com/locate/nds

Towards a More Complete and Accurate Experimental Nuclear Reaction Data Library (EXFOR): International Collaboration Between Nuclear Reaction Data Centres (NRDC)

N. Otuka,^{1,*} E. Dupont,² V. Semkova,¹ B. Pritychenko,³ A.I. Blokhin,⁴ M. Aikawa,⁵ S. Babykina,⁶ M. Bossant,² G. Chen,⁷ S. Dunaeva,⁸ R.A. Forrest,¹ T. Fukahori,⁹ N. Furutachi,⁵ S. Ganesan,¹⁰ Z. Ge,⁷ O.O. Gritzay,¹¹ M. Herman,³ S. Hlavač,¹² K. Katō,⁵ B. Lalremruata,¹³ Y.O. Lee,¹⁴ A. Makinaga,⁵ K. Matsumoto,² M. Mikhaylyukova,⁴ G. Pikulina,⁸ V.G. Pronyaev,⁴ A. Saxena,¹⁰ O. Schwerer,¹⁵ S.P. Simakov,¹ N. Soppera,² R. Suzuki,⁵ S. Takács,¹⁶ X. Tao,⁷ S. Taova,⁸ F. Tárkányi,¹⁶ V.V. Varlamov,¹⁷ J. Wang,⁷ S.C. Yang,¹⁴ V. Zerkin,¹ and Y. Zhuang⁷

The International Network of Nuclear Reaction Data Centres (NRDC) coordinated by the IAEA Nuclear Data Section (NDS) successfully collaborates in the maintenance and development of the EXFOR library. As the scope of published data expands (e.g. to higher energy, to heavier projectile) to meet the needs of research and applications, it has become a challenging task to maintain both the completeness and accuracy of the EXFOR library. Evolution of the library highlighting recent developments is described.

Full EXFOR Compilation Statistics (based on HISTORY) Information updated: 09-May-2025, 10:59:53

| | NNDC | NEA-DB | NDS | CJD | ATOMKI | CDFE | CNDC | CNPD | JCPRG | UkrNDC | NDPCI | KNDC | KAZMON | CAJaD | KCPDG | RIKEN | | |
|----------|------|--------|-----|-----|--------|------|------|------|-------|--------|-------|------|--------|-------|-------|-------|-----|--|
| #. Year | _ | 489 | 9 | - | = | - | _ | | • | _ | - | * | | _ | _ | • | Sum | |
| 55. 2025 | 16 | | | 1 | | 5 | | 12 | | 9 | 7 | | 2 | | | | 52 | III -206 |
| 54. 2024 | 98 | 4 | | 8 | 6 | 5 | 35 | 22 | 24 | 14 | 13 | 1 | 28 | | | | 258 | <u>NIIIIIIIII -81</u> |
| 53. 2023 | 75 | 56 | 26 | 15 | 4 | 7 | 33 | 20 | 27 | 8 | 43 | 9 | 16 | | | | 339 | |
| 52.2022 | 207 | 40 | 35 | 9 | 9 | 5 | 20 | 19 | 19 | 7 | 43 | 9 | 11 | | | | 433 | <mark> </mark> |
| 51.2021 | 181 | 104 | 42 | 23 | 5 | 12 | 29 | 18 | 36 | 15 | 38 | 10 | 12 | | | | 525 | /////////////////////////////////////// |
| 50. 2020 | 219 | 134 | 77 | 40 | 10 | 12 | 31 | 29 | 41 | 11 | 35 | 3 | 23 | | | | 665 | +92 |
| 49.2019 | 124 | 108 | 44 | 24 | 4 | 34 | 18 | 31 | 37 | 58 | 79 | 7 | 5 | | | | 573 | +54 |
| 48. 2018 | 123 | 111 | 79 | 13 | 16 | 13 | 29 | 48 | 39 | 15 | 23 | 10 | | | | | 519 | +69 |
| 47.2017 | 116 | 62 | 39 | 30 | 21 | 33 | 25 | 29 | 19 | 11 | 54 | 11 | | | | | 450 | +48 |
| 46.2016 | 119 | 72 | 52 | 6 | 29 | 7 | 31 | 27 | 28 | 16 | 8 | 7 | | | | | 402 | |
| 45. 2015 | 103 | 69 | 58 | 7 | 17 | 27 | 30 | 29 | 21 | 12 | 49 | 19 | | | | | 441 | |
| 44. 2014 | 92 | 105 | 55 | 7 | 23 | 21 | 26 | 42 | 27 | 14 | 23 | 4 | | 1 | | | 440 | -20 |
| 43. 2013 | 124 | 83 | 36 | 14 | 11 | 12 | 7 | 25 | 62 | 16 | 51 | 3 | | 16 | | | 460 | |
| 42.2012 | 129 | 201 | 45 | 9 | 22 | 20 | 18 | 41 | 79 | 10 | 19 | 9 | | 26 | | | 628 | +87 |
| 41.2011 | 78 | 97 | 54 | 19 | 16 | 37 | 10 | 50 | 53 | 13 | 59 | 8 | | 47 | | | 541 | +59 |
| 40.2010 | 75 | 100 | 67 | 20 | 8 | 20 | 19 | 53 | 57 | 9 | 14 | 10 | | 30 | | | 482 | 1/1111111111111-260 |
| 39.2009 | 131 | 178 | 84 | 11 | 26 | 19 | 11 | 70 | 104 | 19 | 63 | 7 | | 19 | | | 742 | +82 |
| 38. 2008 | 94 | 192 | 145 | 19 | 15 | 27 | | 84 | 22 | 27 | 15 | | | 20 | | | 660 | -60 |
| 37. 2007 | 125 | 196 | 37 | 21 | 15 | 25 | | 84 | 149 | 34 | 34 | | | | | | 720 | +40 |
| 36.2006 | 159 | 158 | 99 | 26 | 16 | 26 | 21 | 50 | 80 | 25 | 10 | | | 10 | | | 680 | -257 |
| 35. 2005 | 460 | 127 | 119 | 16 | 12 | 16 | 2 | 67 | 100 | 7 | | | | 11 | | | 937 | +90 |
| 34.2004 | 204 | 179 | 187 | 8 | 9 | 16 | | 107 | 72 | 5 | | | | 60 | | | 847 | +312 |
| 33. 2003 | 72 | 114 | 22 | 22 | 31 | 8 | 4 | 136 | 93 | 3 | | | | 30 | | | 535 | +122 |
| 32, 2002 | 92 | 122 | 7 | 18 | 1 | 15 | 1 | 34 | 54 | 1 | | | | 68 | | | 413 | |
| 31.2001 | 128 | 125 | 15 | 14 | 22 | 11 | 7 | 72 | 5 | 3 | | | | 17 | | | 419 | -122 |
| 30. 2000 | 206 | 189 | - 4 | 37 | | 16 | | 66 | | 1 | | | | 22 | | | 541 | +36 |
| 29. 1999 | 171 | 142 | 9 | 20 | | 53 | 5 | 59 | 7 | 1 | | | | 38 | | | 505 | +82 |
| 28. 1998 | 92 | 188 | 10 | 48 | 1 | 28 | | 5 | 39 | 2 | | | | 10 | | | 423 | +59 |
| 27. 1997 | 110 | 127 | 17 | 46 | 18 | 21 | | 8 | 2 | | | | | 15 | | | 364 | +8 |
| 26. 1996 | 81 | 167 | 10 | 48 | 17 | 11 | 2 | 11 | | | | | | 7 | | 2 | 356 | |
| 25. 1995 | 10 | 112 | 10 | 16 | 38 | 4 | 15 | 3 | 6 | | | | | 31 | | | 245 | +18 |
| 24. 1994 | 4 | 107 | 18 | 28 | | 3 | 7 | 4 | 50 | | | | | 5 | 1 | | 227 | +36 |
| 23. 1993 | 35 | 47 | 12 | 22 | | 10 | 23 | 15 | | | | | | 16 | | 11 | 191 | -15 |
| 22. 1992 | 35 | 12 | 54 | 41 | | 5 | 15 | 34 | 3 | | | | | 3 | | 4 | 206 | -115 |
| 21. 1991 | 49 | 37 | 10 | 43 | | 107 | 21 | 14 | 19 | | | | | 21 | | | 321 | +95 |
| 20. 1990 | 73 | 21 | 17 | 30 | | 21 | 9 | 23 | 16 | | | | | 16 | | | 226 | -292 |
| 19. 1989 | 347 | 30 | 13 | 45 | | 19 | 6 | 21 | 9 | | | | | 28 | | | 518 | +186 |
| 18. 1988 | 57 | 35 | 57 | 24 | | 72 | | 23 | 33 | | | | | 31 | | | 332 | -152 |
| 17. 1987 | 219 | 47 | 38 | 33 | | 65 | 1 | 51 | | | | | | 24 | | 6 | 484 | +177 |

Number of articles that still need compilation

| + | | | | | | | | | |
|-------------|-------------|-------------|-------------|-------------|-----------------|-------------|-------------|----------------|-------------|
| 09-May-2025 | 29-Jan-2024 | 28-Nov-2022 | 15-Apr-2020 | 18-Oct-2018 | 10-Nov-2015 | 19-Mar-2013 | 04-Oct-2011 | 14-Sep-2009 | 21-Jun-2007 |
| To do: 1125 | To do: 835 | To do: 784 | To do: 739 | To do: 648 | To do: 421 | To do: 285 | To do: 281 | To do: 257 | To do: 430 |
| 1 2025 80 | 1 2023 169 | 1 2023 4 | 1 2020 73 | 1 2018 126 | 1 2015 178 | 1 2013 52 | 1 2011 174 | 1 2010 3 | 1 2007 94 |
| 2 2024 257 | 2 2022 145 | 2 2022 184 | 2 2019 167 | 2 2017 203 | 2 2014 98 | 2 2012 86 | 2 2010 50 | 2 2009 88 | 2 2006 90 |
| 3 2023 180 | 3 2021 53 | 3 2021 93 | 3 2018 73 | 3 2016 53 | 3 2013 28 | 3 2011 68 | 3 2009 7 | 3 2008 44 | 3 2005 61 |
| 4 2022 117 | 4 2020 73 | 4 2020 77 | 4 2017 114 | 4 2015 41 | 4 2012 27 | 4 2010 30 | 4 2008 3 | 4 2007 28 | 4 2004 61 |
| 5 2021 49 | 5 2019 33 | 5 2019 35 | 5 2016 44 | 5 2014 56 | 5 2011 28 | 5 2009 4 | 5 2007 13 | 5 2006 18 | 5 2003 42 |
| 6 2020 71 | 6 2018 35 | 6 2018 36 | 6 2015 28 | 6 2013 22 | 6 2010 19 | 6 2008 2 | 6 2006 3 | 6 2005 8 | 6 2002 34 |
| 7 2019 30 | 7 2017 71 | 7 2017 80 | 7 2014 43 | 7 2012 13 | 7 2008 3 | 7 2007 11 | 7 2005 4 | 7 2004 29 | 7 2001 10 |
| 8 2018 32 | 8 2016 31 | 8 2016 33 | 8 2013 19 | 8 2011 23 | 8 2007 9 | 8 2006 2 | 8 2004 14 | 8 2003 17 | 8 2000 6 |
| 9 2017 70 | 9 2015 22 | 9 2015 25 | 9 2012 10 | 9 2010 18 | 9 2006 3 | 9 2005 4 | 9 2003 7 | 9 2002 10 | 9 1999 4 |
| 10 2016 31 | 10 2014 38 | 10 2014 39 | 10 2011 24 | 10 2009 1 | 10 2005 5 | 10 2004 14 | 10 2002 1 | 10 2001 3 | 10 1998 1 |
| 11 2015 22 | 11 2013 15 | 11 2013 18 | 11 2010 18 | 11 2008 2 | 11 2004 12 | 11 2003 6 | 11 2000 1 | 11 2000 1 | 11 1997 2 |
| 12 2014 38 | 12 2012 7 | 12 2012 8 | 12 2009 3 | 12 2007 7 | 12 2003 4 | 12 2002 1 | 12 1984 1 | 12 1999 1 | 12 1996 2 |
| 13 2013 14 | 13 2011 17 | 13 2011 18 | 13 2008 2 | 13 2006 4 | 13 2002 1 | 13 2000 1 | 13 1983 1 | 13 1997 1 | 13 1994 1 |
| 14 2012 8 | 14 2010 12 | 14 2010 13 | 14 2007 7 | 14 2005 6 | 14 1996 1 | 14 1984 1 | 14 1973 1 | 14 1996 1 | 14 1989 3 |
| 15 2011 17 | 15 2009 3 | 15 2009 3 | 15 2006 7 | 15 2004 21 | 15 1994 1 | 15 1983 1 | 15 1969 1 | 15 1994 1 | 15 1988 4 |
| 16 2010 12 | 16 2008 2 | 16 2008 2 | 16 2005 15 | 16 2003 8 | 16 1985 1 | 16 1973 1 | | 16 1983 1 | 16 1983 1 |
| 17 2009 3 | 17 2007 6 | 17 2007 7 | 17 2004 19 | 17 2002 11 | 17 1983 1 | 17 1969 1 | | 17 1977 1 | 17 1981 1 |
| 18 2008 3 | 18 2006 6 | 18 2006 5 | 18 2003 6 | 18 2001 1 | 18 1973 1 | | 4 | 18 1973 1 | 18 1980 1 |
| 19 2007 6 | 19 2005 17 | 19 2005 20 | 19 2002 11 | 19 2000 1 | 19 1969 1 | | | 19 1969 1 | 19 1977 3 |
| 20 2006 6 | 20 2004 18 | 20 2004 18 | 20 2001 1 | 20 1996 1 | the even | color_# | of article | s > 10. | 20 1976 1 |
| 21 2005 17 | 21 2003 2 | 21 2003 2 | 21 2000 1 | 21 1994 1 | | | | <i>3 ~ 10,</i> | 21 1973 3 |
| 22 2004 18 | 22 2002 14 | 22 2002 14 | 22 1996 1 | 22 1989 2 | red color | r - # of ar | ticles > 10 | <i>)0;</i> | 22 1970 1 |
| 23 2003 2 | 23 2001 1 | 23 2001 1 | 23 1994 1 | 23 1988 1 | without | color - # d | of articles | s < 10: | 23 1969 2 |
| 24 2002 12 | 24 2000 2 | 24 2000 2 | 24 1989 2 | 24 1987 1 | i ~ ~100 | | | hor of | 24 1967 1 |
| 25 2001 1 | 25 1997 1 | 25 1999 3 | 25 1988 1 | 25 1985 2 | <i>i.e.</i> 107 | o oj aver | uge num | uer Uj | 25 1966 1 |
| 26 2000 3 | 26 1996 1 | 26 1997 1 | 26 1987 1 | 26 1983 2 | compiled | d new Ent | ries in EX | (FOR per | |
| 27 1997 1 | 27 1995 1 | 27 1996 1 | 27 1985 2 | 27 1982 3 | vear = 52 | 74). | | | |
| 28 1996 1 | 28 1994 3 | 28 1995 2 | 28 1983 2 | 28 1981 2 | y cur = 31 | | | | |



Year of compilation / registration

Fig. 1. Number of new publications registered in New X4CoCoS and new entries compiled from the new publications in New X4CoCoS.

1. the network adjusted the productivity very well according to the number of new articles published in the year till c.a. 2020;

2. the number of newly published articles registered by NDS in New X4CoCoS *monotonically decreases* since 2019, and

3. the number of newly compiled entries *decreases more rapidly* from 2021.



Fig. 2. Completeness (fraction of the articles missing in EXFOR for each publication year).

Articles for EXFOR Compilation (Allocation List)

Send your request of compilation

pink: allocated more than 2 years ago. yellow: allocated 1 - 2 years ago. grey: conf. proc. published within 5 years.

Last updated: 2025-05-20

| Centre | ATOMKI | CDFE | CJD | CNDC | CNPD | JAEA | JCPRG | KAZMON | KNDC | NDPCI | NDS | NEADB | NNDC | UKRNDC | Total | TRANS analyzed |
|---|--------|------|-----|------|------|------|-------|--------|------|-------|-----|-------|------|--------|-------------------|---|
| New entries since last meeting ² | 1 | 9 | 9 | 35 | 34 | 0 | 29 | 22 | 2 | 19 | o | 11 | 162 | 21 | 354 | 1510, 1511, 1512, 1513, 1514, 1515, 1516, 1517, 2319, 2320, 3213, 3214, 3215, 3216, 3217, 4217, 4218, 4219, 4220, 4221, 4222, 4223, A110, A111, A112, A113, A114, A115, A116, A117, A118, A119, A120, B036, B037, C235, C236, C237, C238, C239, C240, C241, C242, C243, |
| Revised entries since last meeting ² | 24 | 49 | 163 | 13 | 225 | 0 | 85 | 2 | o | 12 | 17 | 5 | 299 | 8 | 902 | C244, C245, C246, C247, C248, D143, D144, D145, D146, D147, E142, E143, E144, E145, E146, E147, E148, E149, E150, E151, F099, F100, G053, G054, G055, L052, L053, L054, L055, M130, M131, M132, M133, M134, M135, M136, R031, S034 |
| Articles not transmitted yet in EXFOR entries ¹ | 4 | 1 | 2 | 155 | 42 | 11 | 176 | 29 | 25 | 64 | 42 | 428 | 437 | 4 | 1436 ³ | 3 |

 Number of articles excluding conference proceedings published within 5 years. (Conference = Articles registered with conference codes as well as APP/BS, EPJ/CS, JP/CS, NSTP, NSTS, AIP-, JAEA-C-)

2. Number of entries transmitted after preparation of the full summary (WP2024-02) for the last NRDC meeting (2024-05-01). The date of uploading to the NDS Open area is considered as the date of the transmission.

3. Including 16 articles not assigned to any centre.

| Entry# | 1st author | Reference | Published | Centre | Registered | Memo | Comment |
|--------|------------------|------------------------|-----------|--------|------------|-----------|---|
| 20000 | BÄfttger | 0,NSE,106,377,1990 | 1990 | NEADB | 2022-09-27 | | Requestor: Denise Neudecker (see also 3,1AEA-410,188,1987 and 5,82ANTWER,.484,1982) |
| 23857 | Singer | J,ZP/A,359,41,1997 | 1997 | NEADB | 2023-02-13 | | Requestor: Stanislav Simakov |
| 10000 | Ingersoll | J,NIM,147,551,1977 | 1977 | NNDC | 2023-05-07 | | Requestor: Stanislav Simakov (Fig.14) |
| 02627 | Duchemin | J,PMB,60,6847,2015 | 2015 | NEADB | 2024-08-29 | | Requestor: Brett Carlson |
| 40000 | V.N.Nefedov+ | C.71VIENNA.,89,1971 | 1971 | CJD | 2025-05-08 | | Requestor: Roberto Capote |
| 40000 | Yu.S.Zamyatnin+ | C.70HELSINKI,,183,1970 | 1970 | CID | 2025-05-08 | | Requestor: Roberto Capote |
| 10000 | A.Goldstein+ | B,RCS,2,1188,1951 | 1951 | NNDC | 2019-06-18 | CP-D/0979 | ENDF=51GOL1/UKFY=Absent.New entry. |
| 10000 | C.R.Dillard+ | B,RCS,2,692,1951 | 1951 | NNDC | 2019-06-18 | CP-D/0979 | ENDF=51DIL1/UKFY=Absent.New entry. |
| 10000 | D.E.Waters+ | B,RCS,3,1507,1951 | 1951 | NNDC | 2019-06-18 | CP-D/0979 | ENDF=51WAT1/UKFY=Absent.New entry. |
| 10000 | D.W.Engelkemeir+ | B,RCS,3,1334,1951 | 1951 | NNDC | 2019-06-18 | CP-D/0979 | ENDF=51ENG1/UKFY=Absent.New entry. |
| 10000 | E.J.Hoagland+ | B,RCS,2,660,1951 | 1951 | NNDC | 2019-06-18 | CP-D/0979 | ENDF=51HOA2/UKFY=Absent.New entry. |
| 10000 | E.P.Steinberg+ | B,RCS,2,877,1951 | 1951 | NNDC | 2019-06-18 | CP-D/0979 | ENDF=51STE2/UKFY=Absent.New entry. |
| 10000 | E.P.Steinberg+ | B,RCS,3,1378,1951 | 1951 | NNDC | 2019-06-18 | CP-D/0979 | ENDF=51STE3/UKFY=Absent.New entry. |
| 10000 | J.A.Marinsky+ | B,RCS,2,1229,1951 | 1951 | NNDC | 2019-06-18 | CP-D/0979 | ENDF=51MAR1/UKFY=Absent.New entry. |
| 10000 | L.E.Glendenin+ | B,RCS,2,992,1951 | 1951 | NNDC | 2019-06-18 | CP-D/0979 | ENDF=51GLE3/UKFY=Absent.New entry. |
| 10000 | L.Winsberg | B,RCS,2,1311,1951 | 1951 | NNDC | 2019-06-18 | CP-D/0979 | ENDF=(51WIN4)/UKFY=Absent.New entry. |
| 10000 | R.R.Schuman | B,RCS,2,1191,1951 | 1951 | NNDC | 2019-06-18 | CP-D/0979 | ENDF=51SCH1/UKFY=Absent.New entry. |
| 10000 | S.Katcoff+ | B,RCS,2,1005,1951 | 1951 | NNDC | 2019-06-18 | CP-D/0979 | ENDF=51KAT5/UKFY=Absent.New entry. |
| 10000 | S.Katcoff+ | B,RCS,2,1017,1951 | 1951 | NNDC | 2019-06-18 | CP-D/0979 | ENDF=51KAT8/UKFY=Absent.New entry. |
| 10000 | S.Katcoff+ | B,RCS,2,1167,1951 | 1951 | NNDC | 2019-06-18 | CP-D/0979 | ENDF=51KAT7/UKFY=Absent.New entry. |
| 10000 | S.Katcoff+ | B,RCS,2,587,1951 | 1951 | NNDC | 2019-06-18 | CP-D/0979 | ENDF=51KAT1/UKFY=Absent.New entry. |
| 10000 | S.Katcoff+ | B,RCS,2,591,1951 | 1951 | NNDC | 2019-06-18 | CP-D/0979 | ENDF=51KAT2/UKFY=Absent.New entry. |
| 10000 | S.Katcoff+ | B,RCS,2,982,1951 | 1951 | NNDC | 2019-06-18 | CP-D/0979 | ENDF=51KAT4/UKFY=Absent.New entry. |

Conclusions:

The number of pending articles increases last several years:

 \rightarrow Check X4CoCoS regularly and minimize delay in compilation.

A few centres almost stopped compilation of new articles in the last years:

→*Network should pay closer attention to progress in their compilation at future NRDC meetings*

The number of articles registered in New X4CoCoS decreases:

 \rightarrow NDS should allocate enough resources not to miss articles related to EXFOR scope



Many thanks to V. Zerkin and N. Otsuka for sending me necessary statistics.