

Conclusions and Actions of the NRDC 2019 Meeting

Conclusions

General

- C1 The next full NRDC meeting will be held in Vienna, Austria between 18 and 22 May 2020 (4 or 5 days) N.B. 1 July 2020 is the 50th anniversary of the first EXFOR exchange).
- C2 Each Centre will be encouraged to submit an item for addition in the agenda of the planned 50th anniversary session of the next full NRDC meeting (*e.g.*, short presentation about the history of the relation between the centre and NRDC).
- C3 The next technical NRDC meeting will be held in Vienna, Austria in the 2nd quarter of 2021.
- C4 The next EXFOR compilation workshop will be held in Vienna, Austria in the 4th quarter of 2020.

EXFOR Statistics and Coverage

- C5 NNDC will scan each issue of IMP/E, and provide the results to NDS.

Manuals and Dictionary

- C6 Revision of EXFOR Formats Manual “SAMPLE” and LEXFOR “Sums” (CP-D/964=WP2019-08) was approved after replacing “412 keV gamma” with “412 keV prompt gamma”.
- C7 Revision of LEXFOR “Polarization” (CP-D/970=WP2019-09) was approved.
- C8 Addition of LEXFOR “Kerma factors” (4C-4/219=WP2019=10) was approved.
- C9 Revision of LEXFOR “Institute” (CP-D/976=WP2019-11) was approved after the elimination of the sentence “The sequence of the institutes should be the same as in the primary reference.”.
- C10 Two new dictionaries (Dictionaries 114 and 115) are ready for testing by retrieval systems.
- C11 New codes (TER,FY,,RES; CI/ASECMEV; ISP,SIG; ,DA,,RS/TMP) proposed by NEA Data Bank (CP-N/146, 147 and 149=WP2019-13) were approved.
- C12 Creation of Dictionary 38 (Supplemental information) proposed in CP-D/965 Rev=WP2019-21 was approved.

EXFOR Compilation Needs

- C13 Completeness of fission product yields in EXFOR was checked by two independent methods – (1) checking of EXFOR against NSR (CP-C/464, 465 and 466=WP2019-19), and (2) checking of EXFOR against citation lists of evaluation summary by Mills for UKFY and England & Rider for ENDF (WP2019-20).
- C14 New keyword SUPPL-INF (supplemental information) and relevant update of manuals (EXFOR Formats Manual “REACTION” and “SUPPL-INF” as well as LEXFOR “Supplemental information”) proposed in CP-D/965 Rev=WP2019-21 were approved. Note that only two keywords SUPPL-INF and HISTORY are allowed in the BIB section providing the supplemental information.
- C15 The ENDF library community needs an experimental atomic reaction database for validation purposes.

EXFOR Quality Control

- C16 Volume numbers of VMU (Vestnik Moskovskogo Universiteta – Seriya III, Fizika i Astronomiya) are absent for the issues published in 1948 to 1969 and 1996 to the present.

EXFOR Coding Rule

- C17 Revisions of the EXFOR Formats Manual and LEXFOR proposed by Memo CP-C/393=WP2019-27 were approved.
- C18 Redundant information should be included only when there is a good reason specific to the entry. Furthermore, the length of a BIB section should not be increased when neither additional information nor a better explanation is offered - this makes the entry less user friendly. (c.f. CP-C/393=WP2019-27)
- C19 Revision of LEXFOR “Independent and cumulative data” proposed in Memo CP-D/977 Rev. (= WP2019-29 Rev.) was approved.
- C20 The branch code IND will be used only when SF6=FY.
- C21 Revisions of LEXFOR “Data type” and “Delayed fission neutrons” proposed in Memo 4C-3/414 Rev.=WP2019-30 were approved.
- C22 The code coded in REACTION SF2 cannot be repeated in REACTION SF3 (c.f. CP-D/960=WP2019-31).
- C23 The expansion of the status code NCHKD will be “authenticity not confirmed”. The code is used only when there is no other status code applicable (e.g., NDD, SCSRS). However, the data tabulated or plotted by other than the experimentalist will not be compiled in the future. Revision of LEXFOR “Status” proposed by Memo CP-D/973=WP2019-32 was approved.

- C24 Revision of LEXFOR “Ratios” and “Fractional” as well as dictionary updates proposed in Memo CP-D/974=WP2019-33 were approved.
- C25 Conference proceedings published in CEA-CONF, CONF, NBS-SPEC-PUB or STI/PUB report should be coded with the conference code.
- C26 EXFOR 41224 will be merged into EXFOR 41202 after deletion of 41224.002 (4C-4/222=WP2019-35).

Tools for Compilation and Dissemination

- C27 The CNPD EXFOR-Editor has a new function to assemble EXFOR entries to prepare a TRANS tape.
- C28 The EXFOR leaflet was edited by CNPD, which has been printed by CNDC and distributed via the NRDC.
- C29 Compilers are encouraged to inform the NSR compiler(s) if EXFOR entries are deleted or modified in such a way that affects the NSR database.

Actions

EXFOR Statistics and Coverage

- A1 All (Standing action) Give the highest priority to compilation of new articles.
- A2 All (Standing action) Correct erroneous entries listed on the EXFOR Feedback List according to the indicated priorities. All urgent corrections must be done by the next meeting.
- A3 Otsuka (Continuing action) Send transmission statistics and correction statistics to centres every three months.

Manuals and Dictionaries

- A4 Otsuka (Continuing action) Update Dictionaries every four months.

- A5 Otsuka (Continuing action) Revise the EXFOR Formats Manual for
- (1) "DECAY-DATA" and "RAD-DET" (CP-D/874=WP2016-28),
 - (2) "Reaction specification" (CP-D/880 Rev.=WP2016-29, CP-D/896=WP2016-33, CP-N/143=WP2018-12),
 - (3) "LEVEL-PROP" (CP-D/882=WP2016-30),
 - (4) "ERR-ANALYS" (CP-D/894 Rev.=WP2016-32),
 - (5) "FACILITY" (CP-D/899=WP2016-34),
 - (6) "REFERENCE" (CP-C/452=WP2017-08, CP-D/920=WP2017-33, CP-D/953Rev=WP2018-08, NRDC2018 Conclusion 4),
 - (7) "STATUS" (CP-D/915=WP2017-09),
 - (8) "INC-SPECT" (CP-D/932=WP2017-31),
 - (9) BIB Section (CP-D/942=WP2018-09),
 - (10) "SAMPLE" (CP-D/964=WP2019-08),
 - (11) "REACTION" and "SUPPL-INF" (CP-D/965 Rev.=WP2019-21).
 - (12) "DECAY-DATA", "PART-DET" and "RAD-DET" (CP-C/393=WP2019-27).
- A6 Otsuka (Continuing action) Revise LEXFOR for
- (1) "Thermal Neutron Scattering" (4C-3/403 =WP2016-08),
 - (2) "Fission Yields" (CP-D/895=WP2016-09),
 - (3) "Thick- and thin-target yields" (CP-D/893=WP2016-31),
 - (4) "Isomeric flags" (CP-D/896=WP2016-33),
 - (5) "Status" (CP-D/904=WP2016-35, CP-C/443=WP2016-36),
 - (6) "Sample" (CP-D/928=WP2017-35),
 - (7) "Multilevel Resonance Parameters" (CP-D/953Rev=WP2018-08),
 - (8) "Reference" (CP-D/953Rev=WP2018-08),
 - (9) "Thermonuclear reaction rate" (CP-D/956=WP2018-11),
 - (10) "Sums" (CP-D/964=WP2019-08),
 - (11) "Polarization" (CP-D/970=WP2019-09),
 - (12) "Kerma factor" (4C-4/219=WP2019-10),
 - (13) "Institute" (CP-D/976=WP2019-11),
 - (14) "Supplemental information" (CP-D/965 Rev.=WP2019-21).
 - (15) "Decay data" and "Outgoing particles" (CP-C/393=WP2019-27),
 - (16) "Independent and Cumulative data" (CP-D/977 Rev.=WP2019-29 Rev.),
 - (17) "Data type" and "Delayed fission neutrons" (4C-3/414 Rev.=WP2019-30) but removing SF5=IND,
 - (18) "Status" (CP-D/973=WP2019-32),
 - (19) "Ratios" (CP-D/974=WP2019-33),
 - (20) "Fission yields" (CP-D/974=WP2019-33).
- A7 Zerkin Fleming (Continuing action) Summarize the role of family flags (also known as family codes, c.f. EXFOR Formats Manual Chapter 6) in ZCHEX (c.f. WP2017-11) and verify their potential use in JANIS.
- A8 Otsuka Propose a revised NRDC Protocol Appendix B "Scanning responsibility" for elimination of journals assigned to a centre but also scanned by NDS (c.f. WP2019-05).

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| A9 | Zerkin
Otsuka | Propose a numbering scheme for compound codes defined in Dictionary 209. |
| A10 | Otsuka | Check if we can make the process code EC (electron capture) obsolete. |
| A11 | Otsuka | Update Dictionary 34, 37 and 236 as suggested CP-D/974=WP2019-33. |

CINDA

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| A12 | Zerkin | (Continuing action) Export EXFOR to CINDA, and distribute it to other Centres every month. |
| A13 | Zerkin
Sublet | Keep NRDC informed about the situation about import of NSR to CINDA. |

EXFOR Compilation Needs

(Underlined items are registered in the Article Allocation List.)

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| <u>A14</u> | Fleming | (Continuing action) Compile with priority the articles cited in the NACRE II (an update and extension of European Compilation of Reaction Rates for Astrophysics) listed in Tables 1 and 2 of CP-D/833. |
| <u>A15</u> | Pritychenko | (Continuing action) Compile with priority articles related to the neutron dosimetry cross sections listed in the second table of CP-D/838. |
| <u>A16</u> | Pritychenko | (Continuing action) Compile the thermal neutron-induced reaction data cited in Mughabghab's "Atlas of Neutron Resonances" and listed in 4C-3/395. |
| <u>A17</u> | Pritychenko | (Continuing action) Compile with priority prompt fission neutron multiplicities listed in CP-D/871. |
| <u>A18</u> | Fleming
Pritychenko | (Continuing action) Compile articles presented in Reactor Dosimetry Symposia listed in 4C-3/400=WP2016-16. |
| <u>A19</u> | Fleming
Pritychenko | (Continuing action) Compile thermal neutron scattering data listed in 4C-3/404= WP2016-19. |
| <u>A20</u> | Pritychenko | (Continuing action) Compile Pn values adopted in Rudstam's review (4C-3/410=WP2018-20). |
| <u>A21</u> | Pritychenko
Tada | (Continuing action) Compile with priority the proton-induced isotope production cross sections listed in CP-D/725 Rev. (~WP2012-19). Notify Okumura if the assigned centre does not compile the high energy ($E > 1$ GeV) data in the list. |
| <u>A22</u> | Pritychenko
Taova | (Continuing action) Compile with priority the articles related to ion beam analysis application listed in CP-D/832 Rev. |

- A23 Pritychenko (Continuing action) Compile with priority the light charged-particle
Tada induced isotope production cross sections listed in CP-D/757. Notify
Taova Okumura if the assigned centre does not compile the high energy ($E > 1$
GeV) data in the list.
- A24 Pritychenko (Continuing action) Compile with priority the neutron source spectra
Tada listed in CP-D/700 (Rev.3).
- A25 Devi Compile articles reporting experimental fission product yields and listed
Fleming in CP-C/464, 465 and 466. Inform Okumura if an article in the lists is
Gritzay not for EXFOR compilation. Transmit EXFOR entries relevant to these
Mikhailiukova lists (and WP2019-20) separately from other EXFOR entries.
Okumura
Pritychenko
Tada
Varlamov
Wang
- A26 Fleming Compile articles reporting experimental fission product yields and listed
Devi in WP2019-20. Inform Okumura if an article in the list is not for
Mikhailiukova EXFOR compilation. New and revised EXFOR entries relevant to these
Wang lists must be transmitted separately from other EXFOR entries. Transmit
Okumura EXFOR entries relevant to this list (and CP-C/464, 465 and 466)
Pritychenko separately from other EXFOR entries.
- A27 Pritychenko Compile deuteron-induced reaction data compiled by the Frascati group
and listed in CP-D/758.
- A28 Gritzay Compile articles published in the “Nuclear Spectroscopy and Structure”
(Nucleus) conference proceedings and listed in CP-D/881.
- A29 Gritzay Compile articles published in JEL and listed in CP-D/952.
Okumura
Taova
- A30 Gritzay Compile data measured with filtered neutrons measured at the KINR
research reactor with numerical neutron spectra.
- A31 Pritychenko (Continuing action) Monitor availability of P.E. Koehler’s time-of-flight
spectra on DVDs received from ORELA in 2015 for EXFOR
compilation.
- A32 Pritychenko (Continuing action) Compile $^{238}\text{U}(n,f)$ cross sections in Table 4.6 of
Zchariah W. Miller’s thesis (Univ. of Kentucky, 2015).
- A33 Fleming (Continuing action) Receive the experimental fission product yield data
Sublet collected by Robert Mills. Identify the numerical data sets missing in
EXFOR once they are received.

- A34 Pritychenko (Continuing action) Perform EXFOR completeness checking for the list of articles (4C-3/401, articles cited in S. Mughabghab's "Atlas of Neutron Resonances") to identify articles missing in EXFOR, and assign responsibility of compilation of the identified articles to centres by a memo.
- A35 Zholdybayev (Continuing action) Scan domestic publications (*e.g.*, journals, laboratory reports) to identify articles for EXFOR compilation.

EXFOR Quality Control

(Underlined items are registered in the EXFOR Feedback List.)

- A36 Varlamov (Continuing action) Correct reference code for VMU, and add its English translation (MUPB) under REFERENCE in M0293.001 as listed in CP-F/015=WP2018-26.
- A37 Mikhailiukova (Continuing action) Add English translation information of Russian journals (KSF, FCY, ZET, ZTF) under REFERENCE as listed in Memo CP-D/957=WP2018-24.
- A38 Mikhailiukova (Continuing action) Correct reference codes including the year of publication in the volume number field listed in Memo 4C-4/216. (N.B. CJD reported progress in correction in Memo 4C-4/218).
- A39 Fleming Mikhailiukova Pritychenko Revise REACTION codes coded with SF6=POL and SF8=ASY listed in Memo CP-D/970=WP2019-09.
- A40 Fleming Pritychenko Varlamov Revise reference codes under REFERENCE and listed in Tables 1 and 2 of Memo CP-N/148=WP2019-25.
- A41 Pritychenko Revise illegal REACTION codes (SF2=SF3) listed in CP-D/960=WP2019-31.
- A42 Okumura Revise EXFOR entries having STATUS=NCHKD listed in CP-D/973=WP2019-32.
- A43 Mikhailiukova Check if TABLE can replace NCHKD by checking the source articles for 15 entries listed in CP-D/973=WP2019-32.
- A44 Pritychenko Replace the report code with conference code in EXFOR 13224 (CP-D/968=WP2019-34).
- A45 Mikhailiukova Merge EXFOR 41224 into EXFOR 41202 after deletion of 41224.002 (4C-4/222=WP2019-35).

- A46 Fleming (Continuing action) Consider addition of numerical data which are not superseded (SPSDD) and suitable for digitization, but still unobtainable (UNOBT) for neutron-induced reaction data published in old literature for ^1H , ^{16}O , ^{56}Fe , ^{235}U , ^{238}U and ^{239}Pu .
- A47 Fleming
Otsuka (Continuing action) Check the n-p scattering data set in EXFOR 22207.002 (G. Fink) against G. Fink's thesis (e.g., reference frame – lab or c.m.).
- A48 Fleming (Continuing action) Provide a report on mistakes in bibliographies and spells on each preliminary tape.
- A49 Otsuka
Pritychenko (Continuing action) Revise EXFOR entries compiling data sets from ORELA 40 m flight station listed in the Appendix of 4C-3/407=WP2017-30 by addition of
 1) the corrigendum under REFERENCE of the common subentry,
 2) STATUS=OUTDT to each data subentry with the correction factor in free text.
- A50 Otsuka (Continuing action) Submit a revised Memo CP-D/933 by addition of the remark to each subentry from Takács.
- A51 Fleming
Otsuka
Tada
Taova (Continuing action) Following A45, revise the REACTION codes of the thick target considering the changes proposed in Appendix of CP-D/933=WP2017-28 once the originating centre receives extraction of Revised Memo CP-D/933 from Otsuka. Revised entries must be assembled in a preliminary tape without including other entries to make trace of corrections at NDS easier.
- A52 Soppera (Continuing action) Provide JANIS Import Log created from the EXFOR Master File to Otsuka on a regular basis.
- A53 Otsuka (Continuing action) Assess the JANIS Import Log provided by Soppera as above, and register important errors to the EXFOR Feedback System.
- A54 Okumura Check if the usage of REACTION SF5=CUM/M- and (CUM)/M- in the EXFOR Master is consistent with CP-D/977 Rev.=WP2019-29 Rev.

Tools for Compilation and Dissemination

- A55 Fleming (Continuing action) Make available on the NEA Data Bank web site the EANDC and NEANDC reports compiled in EXFOR and not available as INDC reports.
- A56 Pikulina (Continuing action) Continue development and testing of the EXFOR-Editor and InpGraph in cooperation with NDS and other data Centres.
- A57 All (Continuing action) Provide Pikulina feedback on EXFOR-Editor and InpGraph.

- A58 Kimura (Continuing action) Continue development and testing of GSYS in cooperation with NDS and other centres.
- A59 All (Continuing action) Provide Kimura feedback on GSYS.
- A60 Soppera (Continuing action) Continue development and testing of the JANIS TRANS Checker in cooperation with NDS and the other centres.
- A61 All (Continuing action) Provide Soppera feedback on JANIS TRANS Checker.
- A62 Bhattacharyya (Continuing action) Keep centres informed about the progress in development of the EXFOR-I editor.
- A63 Nayak (Continuing action) Monitor progress in development of the EXFOR-I editor.
- A64 Otsuka (Continuing action) Provide EXFOR News every month and consider updates to the IAEA NDS website.
- A65 Otsuka (Continuing action) Support update of the Japanese editor (HENDEL) as time permits.
- A66 Zerkin (Continuing action) Update ZCHEX based on comments from compilers.
- A67 All (Continuing action) Provide feedback to NDS on the existing ZCHEX version (on bugs as well as desired additions.). Bugs must be reported with sample entries which are checked and not checked properly by ZCHEX.
- A68 Zerkin (Continuing action) Develop and distribute the program package including a standalone platform independent program to generate X4+ from a standalone EXFOR entry.
- A69 All (Continuing action) Consider to use the X4+ format for author approval, and also send feedback to Zerkin.
- A70 Zerkin (Continuing action) Continue development of the EXFOR upload web tool.
- A71 Zerkin (Continuing action) Every four months produce an EXFOR distribution with (a) full Dictionary distribution; (b) EXFOR in C4 and XC4 format; (c) Dictionaries in MS Access; (d) X4Map.
- A72 Zerkin (Continuing action) Continue development of the additional database encompassing correction factors and relevant comments for suspect/erroneous data (X4-evaluated) presented in WP2010-19; keep NRDC informed about results, impact and usage statistics of the database.

- A73 Mikhailiukova Dunaeva Zerkin (Continuing action) Clarify the requirements for the introduction of flags to indicate articles published in conference proceedings where the data are not available from the authors on the EXFOR Compilation Control System web page.
- A74 Zerkin Okumura (Continuing action) Consider translation of fission yields in EXFOR to a C4-like format in consultation with experts in the field.
- A75 Zerkin Pritychenko (Continuing action) Continue translation from EXFOR to NSR.
- A76 Jin Kimura Pikulina Zerkin (Continuing action) Study problems in 2D calibration of original pictures, and process of approval of results of digitizing using plotting facilities.
- A77 Fleming Okumura Pritychenko (Continuing action) Finalize and submit EXFOR entries including covariance data provided by Zerkin (WP2017-Z3).
- A78 All (Standing action) Provide Zerkin a list of name aliases to improve the search of EXFOR entries by the author name (WP2014-53).