

EXFOR-2009-05-08

JANIS IMPORT LOG

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NEA Data Bank
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Table of content

Table of content	3
I. Format	5
A. Corrupted ENTRY records	5
B. Corrupted SUBENT records	5
C. Corrupted BIB record	6
D. Corrupted COMMON record	6
E. Corrupted NOCOMMON, NODATA records	6
F. Indicated and actual number of columns in DATA or COMMON tables mismatch	7
G. Columns shift	8
II. BIB sections	12
A. Empty/duplicate keyword	12
B. Dependencies rules	12
C. ANALYSIS keyword	13
D. ASSUMED keyword	14
E. AUTHOR keyword	16
F. DECAY-DATA keyword	17
G. DECAY-MON keyword	19
H. DETECTOR keyword	19
I. FACILITY keyword	20
J. HISTORY keyword	20
K. INC-SOURCE keyword	20
L. INSTITUTE keyword	21
M. METHOD keyword	21
N. MONITOR keyword	22
O. MONIT-REF keyword	23
P. PART-DET keyword	25
Q. RAD-DET keyword	25
R. REACTION keyword	26
S. REFERENCE keyword	29
T. REL-REF keyword	30
U. SAMPLE keyword	32
V. STATUS keyword	32
W. TITLE keyword	32
III. DATA sections	35
A. Suspicious numerical values	35
B. Unknown data heading, data units codes	36

This list of errors is based on manual analysis of JANIS Import Logs obtained with EXFOR backup files EXFOR-2008-05-16.bck and EXFOR-2009-05-08.bck.

These Import Logs are obtained by doing a JANIS Import into a "Dummy" database. This "Dummy" database means that JANIS reads the source file, translates content into Java objects but does not store the result anywhere. This operation produces the XML log file of errors and warnings reported by the translation phase.

This report is a classification of errors by type and/or keyword affected. Most of the time a potential explanation or correction is provided.

The EXFOR dictionaries which were used with EXFOR-2009-05-08.bck were from the latest dictionaries exchange: dicts-2009-02-09, with the expanded dictionary 236 provided with EXFOR-2009-05-08.zip backup.

When tables include the errors which were reported in 2008, then the first column indicates the status of the error:

- **Corr.:** means that the error was corrected (not found in EXFOR-2009-05-08.bck)
- **New:** means that this error was not reported in 2008. This can have several explanations: either the affected entry/subentry is a recent one, or JANIS checks were improved, or another error now corrected was preventing JANIS from reporting this one in 2008.
- **09:** means that this error was present in EXFOR-2008-05-16.bck and is still present in EXFOR-2009-05-08.bck

I. Format

This section summarizes errors which affect the EXFOR 'system identifiers'. See chapter 2 of EXFOR Manual.

A. Corrupted ENTRY records

	Entry	Field	Comment
Corr.	13511	N2 (date of entry or last update)	Illegal value "3" plus unsafe YY->YYYY conversion?
09*	40518		Unsafe YY->YYYY conversion? Should be read as 19990902?
Corr.	C0476		Column shift
Corr.	C1202		Illegal value
New	C1232		Column shift
Corr.	M0546		Column shift
Corr.	M0592		Column shift

*: 40518 was wrongly reported as 40158 in 2008 report

In EXFOR backup file:

Sample correct records:

ENTRY	C1201	20050406	20050610	20050926	C073
SUBENT	C1201001	20050406	20050610	20050926	C073

Corrupted records:

ENTRY	40518	9990902	20000118	20050926	0000
SUBENT	40518001	9990902	20000118	20050926	0000
SUBENT	40518002	19990902	20000118	20050926	0000
SUBENT	40518007	19990902	20000118	20050926	0000
SUBENT	40518013	19990902	20000118	20050926	0000
ENTRY	C1232	2008023	20081219	20081218	C089
SUBENT	C1232001	2008023	20081219	20081218	C089
SUBENT	C1232002	20050527	20050801	20050926	C074
SUBENT	C1232003	20050527	20050801	20050926	C074
SUBENT	C1232004	20050527	20050801	20050926	C074
SUBENT	C1232005	20050527	20050801	20050926	C074
SUBENT	C1232006	20050527	20050801	20050926	C074
SUBENT	C1232007	20050527	20050801	20050926	C074

Note that when JANIS meets these records it actually skips the whole entry. So it is possible that other errors are not reported.

B. Corrupted SUBENT records

	Subentry	Comment
09	14059.003	Column 23 should be blank
Corr.	22906.005	"C" in column 12 is probably a "Changed" flag which should have been written in column 11. See latest EXFOR format manual, chapter 8

Corr.	30496.003	N1 should contains a date
Corr.	30791.002	Probably an unsafe YY->YYYY conversion. Year is probably 2001 instead of 1920!
Corr.	32649.003	Probably an unsafe YY->YYYY conversion. Year is probably 2002 instead of 1902!
09	T0085.003	N1 should contains a date
Corr.	V0034.003	Columns 13-14 should be blank

In EXFOR backup file:

ENTRY	14059	20051213	20060315	20060314	1339
SUBENT	14059001	20051213	20060315	20060314	1339
SUBENT	14059002	20051213	20060315	20060314	1339
SUBENT	140590032	20051213	20060315	20060314	1339
ENTRY	T0085	20010302	20010514	20050926	0000
SUBENT	T0085001	20010302	20010514	20050926	0000
SUBENT	T0085002	20010130	20010514	20050926	0000
SUBENT	T0085003	D	20010514	20050926	0000

C. Corrupted BIB record

Subentry 31520.001:

SUBENT	31520001	20080509	20080710	20080710	3127
BIB	C	15	41		
REFERENCE	(J, I PA, 39, 487, 200108)				

'C' could be an alteration flag which should have been put in SUBENT record.

D. Corrupted COMMON record

Subentry 40653.002:

COMMON	2	3		
--------	---	---	--	--

N2 field should be right adjusted to column 33. (in EXFOR-2008-05-16.bck and EXFOR-2009-05-08.bck)

E. Corrupted NOCOMMON, NODATA records

Documentation states that N1 and N2 are "Presently unused (may be blank or zero)."

A check has been introduced in 2009 to assert that these fields contain either blanks or zero. This is ok for all but the 30 records listed below (89535 records total).

If this should be accepted then maybe the EXFOR Manual could be updated.

SUBENT	10764007	801204	20050926	0000
NODATA	4	1		
SUBENT	10764008	801204	20050926	0000
NODATA	4	1		
SUBENT	10764009	801204	20050926	0000
NODATA	4	1		
SUBENT	10785003	790511	20050926	0000
NOCOMMON	1	3		
SUBENT	10817011	801204	20050926	0000
NODATA	4	59		
SUBENT	10817012	801204	20050926	0000
NODATA	4	59		
SUBENT	10817013	801204	20050926	0000
NODATA	3	28		
SUBENT	10817014	801204	20050926	0000
NODATA	3	28		

SUBENT	10817015	801204		20050926	0000
NODATA	3	28			
SUBENT	10817016	801204		20050926	0000
NODATA	3	28			
SUBENT	10817017	801204		20050926	0000
NODATA	3	28			
SUBENT	10817018	801204		20050926	0000
NODATA	3	28			
SUBENT	10817019	801204		20050926	0000
NODATA	3	28			
SUBENT	12399003	800528		20050926	0000
NODATA	3	16			
SUBENT	20921004	791010		20050926	0000
NOCOMMON	1	3			
SUBENT	20984004	810722		20050926	0000
NODATA	2	1			
SUBENT	21141003	800328		20050926	0000
NOCOMMON	1	3			
SUBENT	21141004	800328		20050926	0000
NOCOMMON	1	3			
SUBENT	21141005	800328		20050926	0000
NOCOMMON	1	3			
SUBENT	21141006	800328		20050926	0000
NOCOMMON	1	3			
SUBENT	32513002	920706		20050926	0000
NOCOMMON	3				
SUBENT	32528001	921005		20050926	0000
NOCOMMON	3	10			
SUBENT	32534001	921005		20050926	0000
NOCOMMON	3	8			
SUBENT	32535001	921005		20050926	0000
NOCOMMON	2	8			
SUBENT	40339001	20030530	20040112	20050926	0000
NOCOMMON	3	3			
SUBENT	41153005	950322		20050926	0000
NOCOMMON	3				
SUBENT	M0431001	20010419	20010711	20050926	0000
NOCOMMON	1	3			
SUBENT	M0617001	20010215	20010711	20050926	0000
NOCOMMON	1	3			
SUBENT	M0692001	20060731	20060823	20060731	M040
NOCOMMON	1	3			
SUBENT	M0739002	20080410	20080516	20080512	M045
NOCOMMON	1	3			

Several NOCOMMON and NODATA records contain figures in free text. This is allowed by format but meaning of this text is unknown. E.g.:

SUBENT	10271002	20011204	20020117	20050926	0000
NOCOMMON	0	0 3			
NODATA	0	014			

F. Indicated and actual number of columns in DATA or COMMON tables mismatch

	Subentry	Table	DATA/COMMON N1 field	Actual number of columns/fields
Corr.	10091.002	DATA	5	4
Corr.	22500.006		5	4
09	A1003.004		5	4
09	A1443.002		4	3
09	A1053.003	COMMON	3	2

09	A1488.005		3	2
09	A1488.006		3	2
09	A1488.007		3	2
Corr.	F0623.005		6	4
Corr.	F0623.006		6	4

G. Columns shift

Column 11 is reserved to define EXFOR pointers, a validation of pointers characters has been added to JANIS parsing code and so a number of column misalignments have been found.

Documentation states that "A pointer is a numeric or alphabetic character (1,2...9,A,B,...Z)".

Subentry 12592.001: parenthesis, the coded value is not parsed

SUBENT	12592001	20050714	20050909	20050926	1336
BIB	10	12			
INSTITUTE	(1USAMIT)				
REFERENCE	(J, PR, 95, 781, 1954)				
AUTHOR	(G. A. Bazorgan, J. W. Irvine Jr., C. D. Coryell)				
TITLE	Preparation and half-life of Cr-55				
FACILITY	(REAC) Brookhaven reactor				
SAMPLE	High-purity Cr metal 2-3 milligrams.				
METHOD	10 sec irradiation of Cr-54 with gold foil of 0.001 in. thickness, comparing activities.				
DETECTOR	(GEMUC) End-window Geiger Mueller tube.				

Subentry 14096.001: double-quote

STATUS	(TABLE) Data taken from table 6 and average fission neutron energy given as in REL-REF				
REL-REF	"Prompt Fission Neutron Spectra", A. B. Smith, Proceedings of a consultant's meeting on prompt fission neutron spectra, IAEA (1972), page 3				
HISTORY	(20060518C) DR (20061120A) DR EN-DUMMY changed to EN				

Subentry 21625.001: parenthesis, the coded value is not parsed

HISTORY	(19800808C) G. C. (19800829E) (20080126A) M. M. Energy units in SUBENT .002 were corrected: "MILLI-EV" -> "EV". Dates were corrected for 4-digits year. Upper-lower case correction. BIB information was added. DATA-ERR was changed into total error ERR-T. ERR-1 - ERR-15 were introduced.				
ANALYSIS	(AREA) Areas under gamma-ray photopeaks were estimated. Cadmium ratio: Co-59 - 17.3 +- 0.2, Ag-107 - 17.7 +- 2.7, Ag-109 - 3.00 +- 0.03.				
CORRECTION	-For self-shielding. -For sensitivity of the 4*pi beta detector to Co-60 gamma rays - 1.0076 correction factor.				

Subentry 22738.002: dot

COMMENT	*By authors*. Intensity calibrations were carried out by folding the measured intensities, corrected for burnup, with previously determined instrumental efficiencies and corrected for self-absorption by a comparison of gamma-ray data with the corresponding electron intensities of known multipolarity. Absolute intensities were determined by assuming that was observe about 95% of the total transition strength populating the ground state. . The intensity of 136.127-KeV photon in the (N, g) spectrum is too large, relative to that of the				
---------	---	--	--	--	--

189.965-KeV line, as compared with their relative intensities measured in the cm-245 alpha-decay. Apparently this discrepancy is due to interference from a fission-product gamma-ray. The energy of the 136-KeV transition has been derived from conversion-electron data.

Subentry 22930.007: dot

REACTION (57-LA-139(N, G)57-LA-140, , SIG, , MXW) Maxwell averaged cross section
 ANALYSIS . Results obtained by integration over the full thermal spectrum including data from 9 to 500 keV taken from JENDL-3.3 evaluated file
 MONITOR (57-LA-139(N, G)57-LA-140, , SIG, , MXW)

Subentry 32662.004: parenthesis, the coded value is not parsed

SUBENT 32662004 20060621 20070213 20070209 3121
 BIB 2 2
 REACTION (92-U-238(N, F)MASS, CHN, FY, , FIS)
 STATUS (TABLE)
 ENDBIB 2

Subentry 40027.002 and 003: parenthesis, the coded value is not parsed

ERR-ANALYS (ERR-S) Statistical error 1.4 %
 (ERR-1) Error of glass scanning 0.5 %
 (ERR-2) Error connected with admixture of strange isotope less 0.2 %
 (ERR-3) Error connected with angular anisotropy of fission less 0.6 %
 (ERR-4) Error connected with slow neutron background less 0.3 %
 (ERR-5) Error connected with neutrons scattered in the walls of target and detector less 0.4 %
 (ERR-6) Error of thermal fission cross sections ratio less 0.2 %
 Total error about 2.2 %
 STATUS (TABLE) Table 1 of Reference.
 ENDBIB 36

Subentry 41433.003: dot

REACTION (92-U-238(N, G)92-U-239, , SIG, , SPA) Effective cross-section
 INC-SPECT . Spallation target was a lead cylinder covered by four-section U-blanket. Proton beam 1.5 GeV, total fluence 1.1(+0.1)e13 protons.
 Neutron fluence:
 (1.7+-0.3)E-3 N/cm2 per primary P for 2Nd section,
 (1.6+-0.3)e-3 N/cm2 per primary P for 3rd section.
 SAMPLE . Two depleted uranium samples of 5.33+-0.14 and 14.37+-0.27 mg. Mass on the top of 2Nd and 3rd section of the U-blanket. U-235/U-238=0.18+-0.01% .

Subentry 41505.001: parenthesis, the coded value is not parsed

METHOD (TOF) Distance from neutron source to filter-sample - 115 m, to sample-radiator - 122 m, to neutron detector - 124 m.
 (COINC) Coincidence multiplicities from pulses of 16 spectrometric channels.
 (TRN) Transmission measurement for total cross-sections determination.
 MONIT-REF (, P. F. Rose+, R, ENDF-102, 1988) ENDF/B-6
 SAMPLE Thin metallic disks .

Subentry A0584.001: parenthesis, the coded value is not parsed

METHOD (Si ta)
 (EXTB)
 (GSPEC)
 DETECTOR (GELI) A 95 cm3 detector at an angle of 125 degree. The detector was used to accumulate detailed low energy gamma-ray spectra
 (HPGE) A high-purity intrinsic Ge detector at 55 degree with respect to the beam direction for the

accumulation of all gamma-rays up to 7MeV.

Subentry C1244.001: parenthesis, the coded value is not parsed

FACILITY (VDGT,1USAYAL) tandem FN Van de Graaff accelerator
at the University of Notre Dame
INC-SPECT 37Cl beams with energies ranging from 94.5 to
116.5 MeV
ANALYSIS (INTAD)

Subentry C1581.001: 'i'

DETECTOR (PS,SILI) Four pairs of Si(Li) detectors for particle
identification
(SCIN) Two plastic scintillation detectors for
time-of-flight
(NAICR) Used as additional detector
for particle identification
Acceptance angle of detectors downstream of the target
is defined as half angle of the forward cone subtended
by the most distant (downstream) detector, as measured
from the target.

Subentry D0041.003: 'p'

REACTION (3-LI-7(P,N)4-BE-7,,DA,,RSO) diff. cross-section
relative to 0 degree in c.m. system.
ANALYSIS proton recoil proportional counter
SAMPLE LiF target on 0.3 mm ag.
, -56 micro-g/cm-2 for incident energies 2050, 2150 keV. -
, -77 micro-g/cm-2 for incident energies 2250, 2300,
2350, 2450 keV . -

Subentry D0155.006: text (note: 'T' being a valid pointer it is not reported by JANIS)

REACTION (17-CL-0(A,EL)17-CL-0,,DA,,RTH)
SAMPLE The Cl target is a natural abundant BaCl2 (50 nm) film
evaporated on a self-sputtering carbon film.
STATUS (CURVE) Curve from fig. 6

Subentry D6060.001: illegal character

COMMENT Studies on the oxygen-16 induced fission of 209-Bi have
been carried out at particle energies of 89.5 MeV using
gamma ray spectrometry. The cross sections
for the production of fission products have been
determined. The yield distribution of fission products
was found to be symmetric and broad with FWHM around
15 mass units and peak near mass 108.
Charge distribution studies in the oxygen-16 induced
fission of 209-Bi has also been carried out at particle
energy of 89.5 MeV. Relative cumulative yields of
92-Sr, 97-Zr, 99-Mo, 101-Mo, 112-Pd and 117m-Cd have
been determined using gamma ray spectrometry. Width
of charge distribution has been found to be broad.
Total cross section in the oxygen-16 induced reaction
of 27-Al at particle energy of 76.1 MeV been carried
out.

Subentry F0175.001: parenthesis, part of free text

INSTITUTE (1CANOTC)
REFERENCE (J,NP/A,152,481,197009)
SAMPLE Beryllium targets of 50 and 100 mu-g/cm**2 thickness
(+-10%) evaporated on tantalum backings
FACILITY (VDG)

Subentry F0718.001: text (note: 'T' being a valid pointer it is not reported by JANIS, and
only the first lowercase letter is reported as an error because the keyword parsing is
interrupted by the first error met)

ERR-ANALYS (ERR-DIG)Digitizing error
Estimated percentage errors in the absolute cross
sections
Source of error Percentage error in cross section
angle of observation 1%, 10.0=< ANGI ab =<150.0 degr.
2%, 150.0=< ANGI ab =<160.0 degr.

3%, 160.0= \leq ANGI ab \leq 170.0 degr.
 9%, 5.0= \leq ANGI ab \leq 10.0 degr.
 pressure of gas 1%
 temperature of gas 0.5%
 beam collection 1%
 multiple scattering 2%
 gas purity 0.5%
 geometrical factor 2%
 total 3%, 20.0= \leq ANGI ab \leq 150.0 degr.
 4%, 150.0= \leq ANGI ab \leq 170.0 degr.
 10%. 5.0= \leq ANGI ab \leq 10.0 degr.
 The statistical error was less than 1% for the elastic
 deuteron group and varied from 3% to 5% for the proton
 and alpha groups except for the alpha2 group for which
 it was about 10%.

HISTORY (20050418C)

Subentry 00166.011: parenthesis, the coded value is not parsed

EN-SEC (E-LVL, 26-FE-54)
 LEVEL-PROP (26-FE-54, e-lvl=4.72, spin=3., Parity=-1.)
 SAMPLE Fe-54, thickness 48.2 mg/cm², isotopic purity-94.68%.

Subentry 00672.001: dash

ERR-ANALYS (DATA-ERR) Data Point Reader Uncertainty.
 (E-EXC-ERR) Data Point Reader Uncertainty.
 COMMENT - No any Analysis of Possible Uncertainties is Present.
 - By Compiler - Experimental Data For (P,N) Cross
 Section are Presented As Smooth Curve on Little Size
 Figures. Therefore the Curve were Read in Arbitrary
 Data Points.

Subentry 00900.050: dash

ERR-ANALYS (ERR-T) The uncertainty in nuclear data on gamma yields
 and on monitor reaction cross sections provide the
 major contribution to the total error.
 COMMENT - By compiler - isomer transition = 4.5%

Subentry 01175.001: parenthesis, the coded value is not parsed

STATUS (Aprvd) by E. W. Grewe

Subentry 01287.003: dash

REACTION (28-NI-0(A,X)29-CU-61, CUM, SIG)
 COMMENT -By authors. Ni-58(a,p) and Ni-60(a,p+2n) reactions are
 possible only.
 -By compiler. Cu-61 production due to radioactive decay
 of Zn-61 could not be excluded.

Subentry D5010.002: in EXFOR-2008-05-16.bck the free text was starting in reaction pointer column; this subentry along with subentries D5011.002, D5012.002, D5014.002, D5016.002 and D5017.002 were corrected.

Please note that several other errors of this type may exist in EXFOR because the lowercase characters were allowed recently, and the same type of error with free text in uppercase would not be detected by JANIS.

II. BIB sections

A. Empty/duplicate keyword

Subentry 13049.001: 09

ERR-ANALYS keyword is empty (no code, nor free text)

```

SUBENT      13049001      870309      20050926      0000
BIB          9          10
INSTITUTE   (1USANCS)
REFERENCE   (J, NP, 80, 237, 66)
AUTHOR      (W. M. TONEY, A. W. WALTNER)
TITLE       AN INVESTIGATION OF THE 10B(N, ALPHA)7LI *, 7LI
            BRANCHING RATIO.
FACILITY    (REAC) RALEIGH RESEARCH REACTOR
INC-SOURCE  (THCOL)
DETECTOR    (SOLST) SURFACE BARRIER SEMI CONDUCTOR DETECTOR
ERR-ANALYS
HISTORY     (870225C)
ENDBIB     10
    
```

Subentry 30587.001: Corr.

the duplicate keyword ADD-RES was corrected (duplicate chapter removed).

Subentry 31538.008: New

duplicate keyword INC-SPECT (and typo cadminium?)

```

SUBENT      31538008      20080826      20081028      20081023      3130
BIB          5          12
REACTION    (96-CM-244(N, F)ELEM/MASS, CUM, FY, , FIS)
INC-SPECT   Epi-cadminium spectrum would be added
INC-SPECT   Fast neutron spectra
FACILITY    (REAC) The target assemblies were irradiated for
            30 min to 7 hr in a fixed water-moderated, highly
            enriched uranium-fueled swimming pool reactor APSARA
            at a flux of 10**11 n/cm2/s.
    
```

Subentry M0346.002: Corr.

the duplicate keyword COMMENT was corrected (values have been merged)

B. Dependencies rules

Checks of keyword of 3 keyword dependencies rules have been introduced in 2009.

Keyword DECAY-MON used without keyword MONITOR

Subentry	DECAY-MON given in subentry	Comments
10517.005-007	001	subentries 002-004 give MONITOR, reactions SF1(N,F)ELEM/MASS,IND,FY subentries 005-007 reactions SF1(N,F)MASS,,ZP Note: add 'MASS' to reaction 007?
22060.003,004	001	subentry 002 give MONITOR, move DECAY-MON to 002
30797.003,005,007		
31537.002		

32666.002	001	no MONITOR, heading MONIT given in data
32668.002	001	no MONITOR, heading MONIT given in data
41443.003	003	
A0012.006	006	DECAY-MON and MONIT-REF in 006, no MONITOR
A0169.014	001	other subentries give MONITOR
D0492.002,003	002,003	no MONITOR, no MONIT heading
O0985.002	002	no MONITOR, use MONITOR keyword? Note: potential pointer missing for third DATA table column (ERR-T)

RAD-DET used without keyword DECAY-DATA

Subentry	Comment
20815.019, 020	
21168.002, 004	RAD-DET in 002 and 004, no DECAY-DATA
A0052.002	RAD-DET in 002, subentry 003 give RAD-DET and DECAY-DATA
A0054.003-005	RAD-DET in 002-005, 002 give DECAY-DATA
A0104.002	
A0140.002, 003	
A0445.003	
A0494.003	
A0510.212	
B0085.104	
D4073.003, 005-014, 016	

And MONIT-REF used without keyword MONITOR.

This rule triggers 540 warnings which are not detailed in this report.

C. ANALYSIS keyword

	Subentry	Code	Comment
09	K2064.002	(INTAD, INTPD)	INTPD is an unknown code Reaction is (6-C-12(G,X)O-KO-0,,IPA) ,IPA=Diff.cs integrated over partial angular range INTAD=Integration of angular distribution
Corr.	M0346.003	(EN-ERR)	EN-ERR is not a valid code Probably a missing keyword, see below.

SUBENT	M0346003	920826	20050926	0000
--------	----------	--------	----------	------

```

BIB          4      9
REACTION    (18-AR-40(G,N)18-AR-39,PAR,DA,,BRS,EXP)
EN-SEC      (E-EXC,18-AR-39) THE EXCITATION ENERGY AFTER NEUTRON
            EMISSION.
ANALYSIS    THE CROSS SECTION WAS AVERAGED OVER 200 KEV ENERGY IN-
            Tervals TO ILLUSTRATE THE GROSS BEHAVIOR OF THE PHOTON
            ABSORPTION IN THIS REGION.
            (EN-ERR) HALF OF THE ENERGY REGION IN WHICH THE CROSS
            SECTION WAS AVERAGED.
ERR-ANALYS  NO INFORMATION.
ENDBIB      9

```

Was corrected into:

```

SUBENT      M0346003  20090323  20090402  20090324  M047
BIB          4      9
REACTION    (18-AR-40(G,N)18-AR-39,PAR,DA)
EN-SEC      (E-LVL,18-AR-39) The excitation energy after neutron
            emission.
ANALYSIS    The cross section was averaged over 200 keV energy in-
            tervals to illustrate the gross behavior of the photon
            absorption in this region.
ERR-ANALYS  No information.
            EN-ERR is half of the energy region in which the cross
            section was averaged.
ENDBIB      9

```

'EN-ERR' has free text instead of coded value but this subentry do not have 'EN-ERR' column.

D. ASSUMED keyword

From EXFOR manual: "The format of the code is: (heading,reaction,quantity)" with "Reaction field and quantity field: coded as under the keyword REACTION". It is not clearly written that parenthesis should not be used around the reaction but we would argue those parentheses are not part of simple REACTIONs codes. They are in fact the parentheses which delimit the beginning and end of coded data, and so are not parts of the reaction code. So they should not be put in ASSUMED keyword codes.

For reaction combinations the problem is more complicated: EXFOR manual say that "The complete reaction combination must be enclosed in parentheses" but in practice it is not the whole reaction which should be put in parentheses but the combination operands.

For simple reactions in ASSUMED keyword there are ~1700 correctly coded values in EXFOR master. For combinations reaction there are ~10 correctly coded values (e.g. 10680.004, 20889.014, 21180.003, 22735.002, 22735.003, 22947.002, 40607.002, 40824.001, C0024.003, C0166.003, and T0404.004)

	Subentry	Code	Comment
Corr.	10674.003	(ASSUM,(92-U-238(N,G),,WID))	Remove parenthesis
Corr.	13118.002	(ASSUM1,(92-U-238(N,EL)92-U-238,BA,AMP)) (ASSUM2,(92-U-236(N,EL)92-U-236,BA,AMP)) (ASSUM3,(92-U-234(N,EL)92-U-234,BA,AMP))	Remove parenthesis
09	13280.002	(ASSUM1,((92-U-233(N,F)54-XE-139,CUM,FY,,SPA)/ (92-U-233(N,F)MASS,CHN,FY,,SPA))) (ASSUM2,((92-U-233(N,F)54-XE-140,CUM,FY,,SPA)/	Remove parenthesis?

		(92-U-233(N,F)MASS,CHN,FY,,SPA)))	
Subent deleted	13823.002	(ASSUM,(42-MO-95(N,G),,WID))	Remove parenthesis
09	14029.002	(ASSUM1,(79-AU-197(N,G)79-AU-198,,SIG,,MXW))	Remove parenthesis
Corr. replaced by MONITOR	21103.003	(6-C-12(N,TOT),,SIG)	Missing heading in code, and no ASSUM column in data.
Corr. heading added	21198.002	(98-CF-252(0,F),DL,NU)	Missing heading in code, ASSUM and ASSUM-ERR columns given in DATA
Corr. Sum replaced by quantity LF+HF	22152.001	(ASSUM,((92-U-235(N,F),PRE,AKE,LF)+(92-U-235(N,F),PRE,AKE,HF)))	Remove parenthesis?
Corr. Reaction replaced	22306.002	(ASSUM,(((47-AG-107(N,G)47-AG-108,,SIG)+ (47-AG-107(N,G)47-AG-108-M,PAR,SIG))/ (47-AG-107(N,G)47-AG-108,,SIG)))	Remove parenthesis?
Corr. Reaction replaced	22306.003	(ASSUM,(((47-AG-109(N,G)47-AG-110,,SIG)+ (47-AG-109(N,G)47-AG-110-M,PAR,SIG))/ (47-AG-109(N,G)47-AG-110,,SIG)))	Remove parenthesis?
Corr.	22448.002	(ASSUM1,(((55-CS-135(N,G)55-CS-136,,SIG)/ (55-CS-135(N,G)55-CS-136,,RI))) (ASSUM2,(((75-RE-185(N,G)75-RE-186,,SIG)/ (75-RE-185(N,G)75-RE-186,,RI))) (ASSUM3,(((75-RE-187(N,G)75-RE-188,,SIG)/ (75-RE-187(N,G)75-RE-188,,RI)))	Remove parenthesis?
Corr.	22977.002	(ASSUM1,(((27-CO-59(N,G)27-CO-60,,RI,,RNV/FCT)/ (27-CO-59(N,G)27-CO-60,,SIG))) (ASSUM2,(((79-AU-197(N,G)79-AU-198-G,,RI,,RNV/FCT)/ (79-AU-197(N,G)79-AU-198-G,,SIG)))	Remove parenthesis?
09	31523.001	(ASSUM,((98-CF-252(0,F)51-SB-133,CUM,FY)/ (98-CF-252(0,F)53-I-133,CUM,FY)))	Remove parenthesis?

E. AUTHOR keyword

New checks have been introduced in 2009.

	Subentry	Code	Comment
New	11266.001	(E.G.BILPUCH,L.W.WESTON,C.D.BOWMAN, AND H.W.NEWSON)	Delete 'AND'
New	11287.001	(R.M.WILENZICK,K.K.SETH,P.R.BEVINGTON, AND H.W.LEWIS)	Delete 'AND'
New	11725.001	NO AUTHOR GIVEN	Update doc?
New	11990.001	(R.COURTEMANCHE,T.A.EASTWOOD, AND R.D.WERNER)	Delete 'AND'
New	12405.001	(J.HARDY,JR.,D.KLEIN, AND G.G.SMITH)	Delete 'AND'
New	12535.001	(P.R.FIELDS,G.L.PYLE,M.G.INGHRAM,H.DIAMOND,M.H.STUDIER, AND W.M.MANNING)	Delete 'AND'
New	13747.001	GANDS collaboration	Remove 'collaboration' ?
New	14159.001	(M.Devlin,T.N.Taddeucci,G.M.Hale, And R.C.Haight)	Delete 'And'
New	21516.001	.NOT GIVEN.	Update doc?
New	30573.001	(M.AFZAL ANSARI ,M.WASIM AND H.M.AGRAWAL)	Delete 'AND'
New	30743.001	Cumulative Yield Group	Remove 'Group' ?
New	32580.001	(SHEN GUANREN,XIA HAIHONG,TANG HONGQING,ZHOU ZUYING,SUI QINGCHANG,QI BUJIA,KE ZUNJIAN AND ZHOU CHENWEI)	Replace 'AND' with a comma
Corr.	33006.001	(A.K.Pandy, H.Naik, R.J.Singh, A.Ramaswami, P.C.Kalsi, A.G.C.Nair, and R.H.Iyer)	Delete 'and'
New	33016.001	(H.Naik, S.P.Dange, R.J.Singh, And A.V.R.Reddy)	Delete 'And'
New	40257.001	(A.A.BYALKO,A.N.GUDKOV,V.M.ZHIVUN, ET AL.)	Delete 'ET AL.'
	A0234.001	(J.H.Zaidi,S.M.Qaim And G.Stocklin)	Replace 'And' with a comma
New	A0251.001	ISOLDE COLLABORATION	Remove 'COLLABORATION' ?
Corr.	C1295.001	(D.J.Horen,F.E.Bertrand,E.E.Gross,T.P.Sjoreen, D.K.McDaniels,J.R.Tinsley, and J.Lisanti,L.W.Swenson, J.B.McClelland,T.A.Carey,S.J.Seestrom-Morris,K.Jones)	Delete 'and'
Corr.	C1296.001	(T.S.Bauer,G.S.Adams,G.J.Igo,G.Pauletta, and C.A.Whitten, G.R.Smith,J.R.Shepard,R.E.Anderson,R.L.Boudrie, N.J.DiGiacomo,J.J.Kraushaar,R.J.Peterson,G.Hoffmann)	Delete 'and'
Corr.	C1493.001	(K.Sabourov,M.W.Ahmed,S.R.Canon,B.Crowley,K.Joshi, J.H.Kelley,S.O.Nelson,B.A.Perdue,E.C.Schreiber, A.Sabourov,A.Tonchev,H.R.Weller, and E.A.Wulf, R.M.Priorand,M.C.Spraker,H.M.Hofmann and M.Trini)	Delete 'and's Missing comma
New	C1587.001	(X.Chen,Y.W.Lui,H.L.Clark,Y.Tokimoto, And D.H.Youngblood)	Delete 'And'
New	D0380.001	(Xiaodong Zhang,Wenxin Lp,Kemin Fang,Weiyu He,Rong Sheng,Duanzi Ying And Weiqing Hu)	Replace 'And' with a comma

New	D0476.001	(A.Mukherjee,D.J.Hinde,M.Dasgupta,K.Hagino,J.O.Newton And R.D. Butt)	Replace 'And' with a comma
New	D0483.001	(Z.H.Li,B.Guo,S.Q.Yan,G.Lian,X.X.Bai,Y.B.Wang,S.Zeng,J.Su,B.X.Wang ,W.P.Liu,N.C.Shu, Y.S.Chen,H.W.Chang, And L.Y.Jiang)	Delete 'And'
New	D4186.001	(F.Szelecsenyi,G.F.Steyn,Z.Kovacs, And T.N.Van Der Walt)	Delete 'And'
New	D6028.001	(G.V.Ravi Prasad,A.M.Samant,A.Shrivastava,A.Navin,A.Chatterjee, P.Singh, S.Kailas, And V.S.Ramamurthy)	Delete 'And'
New	D6050.001	(R.Tripathi,K.Sudarshan,S.Sodaye,S.K.Sharma, And A.V.R.Reddy)	Delete 'And'
New	D6055.001	(Chinmay Basu,S.Adhikari,S.K.Ghosh,S.Roy,S.Ray,B.R.Behera, And S.K.Datta)	Delete 'And'
New	G0014.001	(Haladhara Naik, Annareddy Venkatramann Reddy,Srinivasan Ganesan, Devesh Raj, Kwangsoo Kim,Guinyun Kim, Young Do Oh, Due Khue Pham, Moo-Hyun Cho,In Soo Ko And Won Namkung)	Replace 'And' with a comma
New	O0548.001	ISOLDE Collaboration	Remove 'Collaboration' ?
New	S0025.001	The First Research Group,The First Research Division	Code as (The First Research Group) ?
New	S0033.001	(P.P.Dmitriev,M.V.Panarin And G.A.Molin)	Replace 'And' with a comma

F. DECAY-DATA keyword

	Subentry	Code	Comment
Corr.	20986.003	(11-NA-24,,DG,1369.,)	Trailing comma should be omitted
Corr.	20986.007		
Corr.	20986.008		
Corr.	20986.009		
Corr.	21205.001	(90-TH-231,25.6HR,DG,25.6,)	
Corr.	21329.002	(29-CU-62,9.73MIN,AR,511.,)	
Corr.	21400.002	(15-P-30,2.50MIN,AR,511.,)	
Corr.	21401.002	(29-CU-62,9.73MIN,AR,511.,)	
Corr.	21403.005	(38-SR-85,70.MIN,DG,388.,)	
Corr.	21403.006		
Corr.	21403.009	(72-HF-178,4.24SEC,DG,427.,)	
Corr.	21521.003	(92-U-237,6.75D,DG,59.6,)	
Corr.	21530.002	(44-RU-111,1.5SEC,B-,)	
Corr.	21590.004	... ((23.)60-ND-147,11.08D,DG,531.0,0.131) ((24.)60-ND-	

		149,1.70HR,DG,424.0,0.082,DG,541.0,0.066) ((25.) L1-PM-151 ,1.18D,DG,339.9,0.24)	L1?
Corr.	30237.005	(11-NA-22-M,266.NSEC,DG,583. KEV)	Unit should not be included
09 article	32665.002	((1.)35-BR-86,55.0SEC,DG,1564.9,0.644, DG,1534.7,0.093) ((2.)35-BR-87,55.7SEC,DG,1419.8,0.32, DG,1476.2,0.117) ((3.)35-BR-88,16.3SEC,DG,775.3,0.65, DG,802.1,0.136) ((4.)53-I-134-M,221.4SEC,DG,271.9,0.79) ((5.)53-I-134- M+G ,3156.0SEC,DG,847.0,0.954, DG,884.1,0.649) ((6.)53-I-136-M,45.0SEC,DG,381.4,0.998, DG,197.3,0.783, DG,370.1,0.175) ((7.)53-I-136- M+G ,84.0SEC,DG,1313.0,0.675, DG,1321.1,0.251) ((8.)53-I-137,24.2SEC,DG,1218.0,0.128, DG,601.0,0.048) ((9.)53-I-138, 6.45SEC,DG,588.9,0.774)	Isotopic mixture, see below *)
09	40841.005	(94-PU-241, 6.04E+5)+-0.06E+5 YR.	Missing half-life unit.
09	41298.035	(40-ZR-89- M+G ,78.41HR)	Isotopic mixture, see below *)
09	41298.089	(63-EU-152- M2+G ,13.57YR)	
09	41406.005	(63-EU-152- M2+G ,13.54YR,DG,121.8,0.284, DG,244.7,0.0751, DG,344.3,0.2658, DG,778.9,0.1296, DG,1112.1,0.1354, DG,1408.0,0.2085)	
09	41406.007	(63-EU-152- M2+G ,13.54YR,DG,121.8,0.284, DG,244.7,0.0751, DG,344.3,0.2658, DG,778.9,0.1296, DG,1112.1,0.1354, DG,1408.0,0.2085)	
Corr.	M0733.005	(34-SE-77-G,7.1 H ,DG,361.,.949)	Bad half-life unit HR should be used for hours
Corr.	M0738.002	(79-AU-196,6.1669D,DG,332.98,, DG,355.68,, DG,426.,, DG,1091.33) (79-AU-195,186.098D,DG,98.85,, DG,129.7) (79-AU-194,38.02HR,DG,293.54,, DG,328.455,, DG,482.83,,	Missing commas

		DG,528.76,, DG,621.974,, DG,1104.05,, DG,1175.36) (79-AU-193,17.65HR,DG,173.,, DG,186.17,, DG,255.57,, DG, 268.22 DG ,439.04,, DG,491.28) (79-AU-192,4.94HR,DG,295.95,, DG,308.45,, DG,316.508,, DG, 582.63 DG ,612.46,, DG,1140.81) (79-AU-191,3.18HR,DG,277.88,, DG,586.45)	
--	--	--	--

*) Isotopic mixture: these codes are not yet supported by JANIS but are probably valid.

G. DECAY-MON keyword

	Subentry	Code	Comment
Corr.	21582.002	(27-CO-60,5.272YR,DG,1173./1333.,)	Trailing comma should be omitted
Corr.	21742.003	(11-NA-24,,DG,1369.,)	
Corr.	21742.004	(27-CO-58-G,,DG,810.,)	
09	32655.001	(11-NA-24,14.96HR,DG,1368.63,1.0) (41-NB-92-M,10.15D,DG,934.44,1.0) (40-ZR-89- M+G ,78.4HR,DG,908.96,0.9987)	Isotopic mixture *)
Corr.	D0380.001	(30-ZN-62,9.26HR,DG,596.6,0.257,DG,548.4,0.152) (30-ZN-65,244.1D,DG,1115.5,0.507) (73-TA-183,5.1D,DG,246.1,0.267,DG,354. D ,0.116) (74-W-87,23.9HR,DG,479.5,0.253,DG,685.8,0.262)	Bad decay radiation energy

*) Isotopic mixture: these codes may be valid, but it is not clear from documentation if isomeric combinations are allowed here.

H. DETECTOR keyword

All 2008 errors were corrected.

Codes from dictionary 22

	Subentry	Code	Comment
Corr. (SPEC)	F0776.001	(SPECT ,SCIN,BGO)	SPECT is not a valid code. Valid codes for spectrometers are: BPAIR, HE3SP, MAGSP, SPEC. There is also D4PI for "4pi detector"

I. FACILITY keyword

All 2008 errors were corrected.

	Subentry	Code	Comment
Corr.	13498.001	(,1USALRL) RTNS-II	Empty facility code Only one institute in this subentry: 1USAAI
Corr.	13528.003	(,1USAANL) INTENSE PULSED NEUTRON SOURCE	Empty facility code Two institute codes in this entry : 1USAORL and 1USAANL
Corr.	13528.004		
Corr.	13528.005	(REAC,1USAORL) TRIPLE-AXIS SPECTROMETER AT ORR	
Corr.	13528.006	(,1USAANL) INTENSE PULSED NEUTRON SOURCE	
Corr.	13528.007		
Corr.	13528.008		
Corr.	A0193.001	(CYCLO,2GERCRC)	Unknown institute Memo CP-N/015 suggest to replace with 2GERDKZ
Corr.	D0437.001	(VDG,2FR CNO)	Unknown institute Was proposed in memo CP-D/484

J. HISTORY keyword

	Subentry	Code	Comment
09	10913.006	(830330A TARGET Z ADDED, DATA SORTED.	Missing closing parenthesis

10913.006 subentry:

HISTORY (820108A) CORRECTED REACTION.
(820326A) CORRECTED REACTION, DATA TABLE.
(830330A TARGET Z ADDED, DATA SORTED.

K. INC-SOURCE keyword

	Subentry	Code	Comment
09	L0037.001	(MPH=1-H-3(P,G)2-HE-4)	Missing parenthesis around reaction
09	L0038.001	(MPH=1-H-3(P,G)2-HE-4)	*) see below
New	M0269.001	(MPH=(1-H-3,(P,G)2-HE-4))	Remove comma
Corr.	M0283.010	(MPH=(26-FE-0(N,G),FE)	Missing closing parenthesis around reaction + FE meaning?
Corr.	M0283.015	(MPH=(24-CR-0(N,G)	Missing closing parenthesis

*) EXFOR format manual is unclear about formatting of 'MPH=' codes, it states that:
 "If the code MPH, followed by the separator = is present, the next field contains a reaction string coded as under the keyword REACTION, SF1-4."

In REACTION keyword the reaction itself is not surrounded by parentheses, the parentheses are the beginning and end of the coded part of REACTION keyword. See ASSUMED keyword.

For code 'MPH=' the manual gives only one example:

```
INC-SOURCE (MPH=(13-AL-27(N, A)11-NA-24))
```

So it looks like the reaction has to be put in parentheses.

Note that it is already the case for more than 160 occurrences of this code.

L. INSTITUTE keyword

Valid codes are given in dictionary 3

	Subentry	Code	Comment
Corr.	A0193.001	(2GERCRC)	Unknown code Memo CP-N/015 suggest to replace with 2GERDKZ
Corr.	D0437.001	(2FR CNO)	Unknown code Was proposed in memo CP-D/484
Ok	G4021.001	(1USABST)Department of Physics, Boston University, Boston, Massachusetts	Memo CP-D/551
Corr.	O1597.001	(2GERNME)	Unknown code Was proposed in memo CP-N/067, 2GERUDE?

M. METHOD keyword

Check of this keyword was introduced in 2009.

Valid codes are given in dictionary 21.

Subentry	Code	Comment
14149.001	(COIN,TOF)	COINC is a valid code
D0208.001	(SSTA,ACTIV,GSPEC)	STTA, (Stacked target irradiation) is a valid code
D0420.001	(SSTA,ACTIV,GSPEC)	
D0483.003	(ANC)	ANC is a valid ANALYSIS code
F0756.001	(TROJA) (EDE)	TROJA is a valid ANALYSIS code
M0752.001	(EXTB.SITA,PSD,TOF)	EXTB and SITA are valid codes
O0899.001	(SITA) See sample (EXTB) A 6-Li(2+) beam at 6 MeV	TROJA is a valid ANALYSIS code

	(TROJA)	
O1221.001	(TROJA) Reaction Li6(d,N+He-3)2-He-4 was used. (EDE)	
O1241.004	(ANC)	ANC is a valid ANALYSIS code
O1317.001	(TROJA) Reaction B-11(d,n+Be-8)2-He-4 was used. (EDE)	TROJA is a valid ANALYSIS code
O1639.001	(TROJA) Reaction H-2(B-10,a+Be-7)n was used (EDE)	
O1652.001	(TROJA) Reaction H-2(4-BE-9,A+LI-6)n was used. (EDE)	
O1653.001	(TROJA) Reaction Li-7(He-3,a+a)1-H-2 was used. (EDE)	
O1661.001	(TROJA) Reaction Li-6(He-3,A+p)He-4 was used. (COINC) alpha particle and proton in coincidence	

N. MONITOR keyword

	Subentry	Code	Comment
New	13443.003.2	((MONIT1)((92-U-235(N,F)42-MO-99,CUM,FY)/(92-U-235(N,F)42-MO-99,CUM,FY,,MXW))) ((MONIT2)92-U-235(N,F)ELEM/MASS,CUM,FY,,MXW)	Remove parenthesis? *)
New	13443.004	((MONIT1)((92-U-238(N,F)42-MO-99,CUM,FY)/(92-U-238(N,F)42-MO-99,CUM,FY,,MXW))) ((MONIT2)92-U-238(N,F)ELEM/MASS,CUM,FY,,MXW)	Remove parenthesis? *)
09	40020.001	(RATIO)	Bad reaction
09	40105.006	(79-AU-197,NG,MXW)	Bad reaction
09	40105.007		
09	40116.001	(STANS)	Bad reaction
09	40587.001	((MONIT1)(5-B-10(N,A+G)3-LI-7,,SIG)) ((MONIT2)(5-B-10(N,A)3-LI-7,,SIG)/(5-B-10(N,TOT),,SIG))	Reaction should not be surrounded by parenthesis
Corr.	A0344.015	((MONIT)13-AL-27(P,3D)11-NA-	Spaces in

		22,UND,SIG, ,,EVAL)	reaction
New	C0226.004		

*) See D ASSUMED keyword chapter.

Subentry 40105.006:

MONI TOR (79-AU-197, NG, MXW)
=99.1 B CAPTURE CROSS-SECTION AT
0.0253 EV ENERGY WAS EQUAL TO (98.6+-0.3) B

Subentry 40105.007:

MONI TOR (79-AU-197, NG, MXW)
=99.1 B. AURUM CAPTURE CROSS-SECTION
AT 0.0253 EV NEUTRONS ENERGY WAS EQUAL TO (98.6+-0.3)B
(90-TH-232(N, G)90-TH-233, , SIG)
RESOLVED RESONANCES

Subentry 40020.001:

DETECTOR (SCIN) LIQUID SCINTILLATION DETECTOR WITH
VOLUME 400 LITRE
(LONGC) LONG COUNTER WAS USED FOR NEUTRONS
FLUX MONI TORING
MONI TOR (RATIO)
PART-DET (G) PROMPT GAMMA-RAYS OF FISSION

Subentry 40116.001:

PART-DET (G) GAMMAS
MONI TOR (STANS) SOURCES OF KNOWN ACTIVITY
(ACCURACY LESS 5 PERCENT)
G-RAY OF REACTIONS CL-36(N, G), S-33(N, G), SI -29(N, G)
WERE USED

Subentry 40587.001

MONI TOR ((MONI T1) (5-B-10(N, A+G)3-LI -7, , SI G))
((MONI T2) (5-B-10(N, A)3-LI -7, , SI G)/(5-B-10(N, TOT), , SI G))

O. MONIT-REF keyword

	Subentry	Code	Comment
Corr.	30671.001	(30523002, LU HAN-LIN+,J,PHE,3,(1),88,197901)	Embedded blank in code (before author)
New	40578.003	(40578002)	Reference field must be present
New	40642.001	(40640001) IODIDE-127	Reference field must be present. Note: IODINE misspelled?
New	C1649.001	(R,IAEA-TECDOC,1211,200105)	Subaccession number and author omitted but commas should be included, add two commas

In EXFOR format manual:

"The code contains 3 main fields which may be preceded by a heading field:

((heading)subaccession#,author,reference)

Embedded blanks are not permitted within the code, except within an author's name"

Here is a list of errors which comes from inspection of JANIS relational database instead of EXFOR master parsing.

MONIT-REF referencing non existing entries/subentries:

Subentry	Missing MONIT-REF referenced Subentry
30443.001	50381004
A0181.005	B0147007
A0389.001	A0156005
C0807.001	C0810002

MONIT-REF which references deleted subentries (NOSUBENT):

Subentry	Bad MONIT-REF referenced Subentry	Should be replaced with
11837.005	13662002	
20710.002	10550008	
A0319.001	B0039003	
A0401.001	P0070006	
B0014.001	B0019007	
B0014.001	B0019010	
B0081.002	B0082002	
B0081.003	B0082002	
B0081.004	B0082002	
B0081.005	B0082002	
B0081.006	B0082002	
B0081.007	B0082002	
B0111.001	B0082002	
B0139.001	B0088005	
B0148.001	B0149002	
B0171.002	B0082002	
F0794.001	C0615002	
O0575.001	O0571004	E1848
O0630.001	B0149002	
O0637.001	B0001004	

P. PART-DET keyword

There are 17 occurrences of code 'LCP' from dictionary 33, meaning "Light Charged Particle (Z less than 7)" but this dictionary does not allow this code to be used in keyword PART-DET (or should allow?).

Subentries:

- 09: 22925.002-013
- 09: 22938.001
- 09: 22947.001
- New: 22952.001 (typo in 08, was included with 22925)
- New: E0838.001
- 09: E2007.049, Note: E2007.002-004, 007-009, 015, 019, 028, 032-034, 044-046, 050, 058, 059, 065, 068 were corrected

(There were 36 occurrences in EXFOR-2008-05-16)

Q. RAD-DET keyword

	Subentry	Code	Comment
Corr.	20931.001	(G)	Missing nuclide field
Corr.	21289.004	(B)	
Corr.	21289.006	(B)	
Corr.	21289.007	(B)	
Corr.	21289.008	(B)	
Corr.	21289.011	(B)	
Corr.	21289.012	(B)	
Corr.	21290.002 to 21290.009	(DG) or (G)	
09	31485.002 to 31485.012	(DG)	Missing nuclide See below
Corr.	31521.001	(DG)	Missing nuclide field
Corr.	A0338.002	(43-TC-94-M,DG) (43-TC-94-G,DG) (43-TC-94- M+G ,DG)	Isotopic mixture, see below *)
Corr.	A0338.003	(43-TC-95-M,DG) (43-TC-95-G,DG) (43-TC-95- M+G ,DG)	Isotopic mixture, see below *)
New	C1597.002		
New	C1597.004		
Corr.	D4167.002	(40-ZR-88)	Missing radiation

	to D4167.005	and/or (39-Y-88)	field
Corr.	O0397.001	(DG)	Missing nuclide field
Corr.	O1503.001	(DG)	

*) Isotopic mixture: these codes may be valid, but it is not clear from documentation if isomeric combinations are allowed here.

Entry 31485

Illegal RAD-DET code 'DG' is used in all subentries and HISTORY keywords contains:

“(19980610U) HW.- PART-DET replaced by RAD-DET.”

But 'DG' would be a valid code for keyword PART-DET, at least since 2006/11 (date of introduction or last modification of this line of dictionary 33)

R. REACTION keyword

1. Formatting errors

	Subentry	Code	Comment
Corr.	10531.006.2	(((67-HO-165(N,EL),,WID,,G)*(67-HO-165(N,G),,WID))/ (67-HO-165(N,TOT),,WID)))	Double parenthesis
Corr.	13744.013.5	(40-ZR-91(N,EL),,WID)	Embedded space in code
Corr.	21999.039	(56-BA-138(N,A)54-XE-135,,SIG)	
Corr.	A0062.002.E	((53-I-127(P,5N)54-XE-123,,SIG)/ (53-I-127(P,3N)54-XE-125,,SIG,))	Trailing comma in reaction component
Corr.	A0136.004.C	(((50-SN-112(A,X)3-LI-6,,DA,,EXP)/ (50-SN-112(A,X)2-HE-4,,DA,,EXP))/ (50-SN-124(A,X)3-LI-6,,DA,,EXP))/ (50-SN-124(A,X)2-HE-4,,DA,,EXP)))	Parenthesis mismatch
09	G3004.002	(92-U-238(E,N)92-U-237,,SIG)	Embedded space in code
New	G4025.008	(6-C-12(G,N)6-C-11,,DA, ,BRA)	
09	M0571.003	(81-TL-0(G,EL)81-TL-0 ,,DA)	
09	M0725.008	(12-MG-0(G,P),PAR,DA ,,BRA/REL)	
Corr.	M0736.002	(79-AU-197(G,N)79-AU-196,,SIG,, BRS)	
New	S0044.002	(26-FE-0(D,X)27-CO-55,,SIG,)	Trailing comma

2. Illegal SF2 field

Subentry C0905.002: Corr.

(83-BI-209(HE6,FUS+F),,SIG)

According to dictionary 33 'HE6' code is not allowed in SF2 field.

It should be written '2-HE-6', like in other subentries (more ~120 occurrences of this form)

Subentry C1468.005: Supported

(14-SI-0(9-F-18-L,NON),,SIG)

DECAY-DATA keyword in this subentry give an half-life of 162ns for 9-F-18-L

Code '-L', (quasi-metastable state) is not yet supported by JANIS

Subentry C1573.003: New

(28-NI-58(2-HE-3,T)29-CU-58,PAR,DA,,REL)

Should be written HE3 (code from dictionary 33), the form Z-S-A-X being reserved for particles heavier than an alpha

3. Illegal SF4 field

26 reactions (or reaction components) make use of isomer code '-T', "sum of all isomers".

EXFOR format manual state that '-T' isomer code is "limited to use within an isomeric ratio in SF4 of the reaction string"

Corr. :

E1853.009: (92-U-238(P,F)59-PR-148-T,(CUM),SIG)

Corr. :

O0715.002: (92-U-238(P,F)37-RB-86-T,,SIG)

O0715.006: (92-U-238(P,F)37-RB-90-T,IND,SIG)

O0715.014: (92-U-238(P,F)55-CS-130-T,,SIG)

O0715.018: (92-U-238(P,F)55-CS-134-T,,SIG)

O0715.019: (92-U-238(P,F)55-CS-135-T,IND,SIG)

O0715.020: (92-U-238(P,F)55-CS-136-T,,SIG)

O0715.022: (92-U-238(P,F)55-CS-138-T,IND,SIG)

O0715.028: (92-U-238(P,F)55-CS-144-T,IND,SIG)

Corr. :

O0736.013: (4-BE-9(28-NI-58,X)27-CO-53-T,,SIG)

O0736.014: (4-BE-9(28-NI-58,X)27-CO-54-T,,SIG)

O0736.023: (4-BE-9(28-NI-58,X)26-FE-52-T,,SIG)

O0736.024: (4-BE-9(28-NI-58,X)26-FE-53-T,,SIG)

O0736.030: (4-BE-9(28-NI-58,X)25-MN-50-T,,SIG)

O0736.032: (4-BE-9(28-NI-58,X)25-MN-52-T,,SIG)

O0736.042: (4-BE-9(28-NI-58,X)23-V-44-T,,SIG)

O0736.057: (4-BE-9(28-NI-58,X)21-SC-42-T,,SIG)

O0736.059: (4-BE-9(28-NI-58,X)21-SC-44-T,,SIG)

Corr. :

O0995.002: this one may be considered as valid but would probably be better coded as (92-U-238(P,F)53-I-132-M/T,IND,DA)

Corr. :

O1143.002: this one also can also be coded as (93-NP-237(P,F)53-I-132-M/T,IND,DA)

O9 :

T0132.003: (50-SN-118(P,N)51-SB-118-T,IND,SIG)

T0132.005: (50-SN-120(P,N)51-SB-120-T,,SIG)

T0132.006: (50-SN-122(P,N)51-SB-122-T,,SIG)
T0132.007: (50-SN-124(P,N)51-SB-124-T,,SIG)

09:

T0138.003: ((48-CD-113(P,N)49-IN-113-T,IND,SIG)/(48-CD-116(P,N)49-IN-116-T,IND,SIG))

09 :

T0138.008: ((52-TE-128(P,N)53-I-128,,SIG)/(52-TE-130(P,N)53-I-130-T,IND,SIG))

4. Unknown Quantity codes

Some subentries use quantity codes not defined (yet?) in dictionary 236:

```
, DA, , CS2/RS in M0133.007
, DA, , SN2/RS in M0186.012-016
, DA, A+RSD in F0880.008
, DA, LF+HF in 00375.007-011
, DA, P+P, TT in C0988.003
, DA, P+RSD in F0880.007
, DA/DA/DP, PIO/P+P/P+P in E2105.002
, DA/DE, P/20-CA-40 in D0271.002
, DE, P+P, TT in C0988.004
, MLT/DE, G, TT in 41507.002
, POL/DA/DA/DE, P/A/RSD in C1559.003
, POL/DA/DA/DP, PIO/P+P/P+P, VAP in E2105.003
, POL/DA2/DE2, P/P in E2108.003-005
, WID/STR, , RM in 23044.002
LL, POL/DA2/DE2, P/P, D in E2108.027-029
LS, POL/DA2/DE2, P/P, D in E2108.023-025
NN, POL/DA, P, K in D0480.006
NN, POL/DA/DE, , ANA in E0816.014-019,032-037, 01321.004,007
NN, POL/DA2/DE2, P/P, D in E2108.011-013
PAR, AKE, N/FF in 14065.007,008,010
PAR, DA, , LEG/1K2 in A0045.005-007
PAR, DA, G, TT in 00913.003
PAR, DA, P, IPA in C0988.002
PAR, DA, P+A in C1559.002
PAR, DA/DE, P/20-CA-40 in D0271.003,004
PAR, IPA/DE in D0475.004
PAR, POL/DA, P/A, ASY in C0157.003
PAR, POL/DA/DA, P/A, ANA in D0463.003
PAR/SEC, AP, HF in 21544.011
PAR/SEC, FY, FF in 21544.012
PR, AKE/DA, N/N+LF in 22756.009,010, 41516.003
PR, AKE/DA, N in 23056.002-005
PR, DA, N+FF in 30318.002
PR, DA, N+LF in 22756.007,008, 41516.002
PR, KE, N in 22464.003, 22650.008, 22660.003
PR, NU/DA/DE, N+LF/N in 22756.002-005
PR/PAR, MLT, G in 14195.002-004
SEC, KE, FF in 21313.013,014, 21543.016,017, 21544.009, 21545.015,016, 23054.011
SEC, KE, LF+HF in 21313.015,016, 21543.014,015, 21544.010, 21545.017,018,
21771.013,014
SL, POL/DA2/DE2, P/P, D in E2108.019-021
SS, POL/DA/DE, , ANA in E0816.008-013,026-031
SS, POL/DA2/DE2, P/P, D in E2108.015-017
TER, DE in 30320.002,003
TER, KE, FF in 22734.003,005, 22859.002, 22899.002
TER/CHG, FY, 4-BE-10 in 41464.005
TER/CHG, FY, 6-C-14 in 41464.006
TER/CHG, FY, A in 41464.004
TER/CHG, FY, LCP in 41464.002
TER/PAR, FY in 22063.002-004
```

JANIS uses quantity code to organize EXFOR data in a tree so cannot understand these subentries.

S. REFERENCE keyword

	Subentry	Code	Comment
Corr.	20011.001 20012.001	See below	Space in column 12 of continuation records is considered as part of code, and embedded spaces are forbidden
Corr.	21665.001	(C,82ANTWER,,131,8209)	Embedded space
Corr.	21688.001	(R,INDC(TUK)-4/L,,8005)	INDC(TUK)- is not a valid code in dict 6, and this dict contains this note: "Some copies of INDC(TUR)-3 are erroneously labelled as INDC(TUK)-3"
Corr.	22583.001	(J,PSPS,42,(3),227,1994)	Unknown code
Corr.	30032.001	(R,EANDC-50,(2),(102),1965)	Page(paper#) field without page indication ? 102 is page? other EANDC-50,(2): EANDC-50,(2),114,196507 EANDC-50,(2),160,196507
Corr.	30038.001	(R,EANDC-50S,(2),(102),6507)	Page(paper#) field ? see 30032.001 similar reference Other EANDC-50S: EANDC-50-S,(95),196507 EANDC-50S,198,196507 EANDC-50S,,196507 EANDC-50S,1,196507 EANDC-50S,93,1966
Corr.	30191.001 30192.002	(S,EANDC-50/S,(1),(22),6507)	Page(paper#) field ?
09	40096.001	(J,IZV,35,(11),23,45,7111)	Too many parts, suspicious comma, see other IZV,35: IZV,35,(1),180,1971 IZV,35,(1),180,197101 IZV,35,(11),2341,197111 IZV,35,(4),823,197104 IZV,35,165,1971 IZV,35,1718,1971 IZV,35,211,197101 IZV,35,2364,197111
09	40114.001	(C,66PARIS,CM-23/107)	Missing date, meaning of CM-23/107? see other 66PARIS
09	40565.001	(C,83MOSKOW,,313,8304)	Should be 83MOSCOW

Corr.	41503.001	(R, JIA -1182,200705)	Code not in dict 6 One of the institute is (4RUSJIA)
Corr.	A0203.001	(C, 82KHARKV ,(2),134,83)	In dict 7: 67KHARKOV 74KHARKOV (obs) 74KHARKV 86KHARKO
New	D0549.001	(J,ARI,,,2009) to be published	Assign volume and page subfields when published
New	E1864.001 E1865.001	(B,LANDOLT,,,1994)	Remove one comma. Note: Dic 207 states book was published in 1973 (reedition?)
Corr.	F0301.001	(C,64PARIS,2,,1054,1964)	Remove one comma
Corr.	O1597.001	(C, 96VANCOU ,,84,1996)	In dict 7: 95VANCOU 99VANCOU 2006VANCOU
Corr.	O1598.001	(C, 96VANCOU ,,60,1996)	
Corr.	S0020.001	(P, BNAL ,103,8912) PROGRESS REPORT FOR BEIJING NATIONAL TANDEM ACCELERATOR LABORATORY 1988-1989.	Unknown code in dict 6, but dict contains: A-BNT- "Beijing Nat. Tandem Accel. Lab., Prog. Report" (not used)
Corr.	V0002.001 V0003.001	(B,LAPENAS,75)	One comma missing

Subentry 20011.001:

REFERENCE ((R, KFK-1000, (SUPP. 2), 6902)=(R, EUR-3963, (SUPP. 2), 6902)=
(R, EANDC(E)-111, (SUPP. 2), 6902)) GRAPHS ONLY.
((R, KFK-1000, 6806)=(R, EUR-3963E, 6806)=
(R, EANDC(E)-111, 6806)) ABOVE 0.9 MEV SODIUM IS TAKEN
FROM THIS REFERENCE.
(W, NEBE, 7012) DATA ON TAPE.

Subentry 20012.001:

REFERENCE ((R, KFK-1000, (SUPP. 1), 6810)=(R, EUR-3963, (SUPP. 1), 6810)=
(R, EANDC(E)-111, (SUPP. 1), 6810)) GRAPHS ONLY.
(W, NEBE, 7012) DATA ON TAPE.

T. REL-REF keyword

Subentry	Code	Comment
Corr.	20770.001	(,20673001,VALKONEN,J,JIN,36,715,7406)
Corr.	21282.003	(,21023002,MERRISON+,J,PRS/A,215,278,5211)
Corr.	21334.001	(N,20465002,MOXON,W,MOXON,,,7112)
		Code from dict 17 must be present (first field)
		Only one comma to separate author and date

Corr.	21544.001	(N,21313001,ASGHAR+,J,NP/A,311,3,413,7812)	Other references NP/A,311:
Corr.	21545.001	(N,21313001,ASGHAR+,J,NP/A,311,3,413,7812)	NP/A,311,205,197811 NP/A,311,492,197812 NP/A,311,93,1978
09	21651.006	(R,21543001,ASGHAR+,J,NP/A,292,,225,79)	Other references NP/A,292:
			NP/A,292,195,1977 NP/A,292,225,197711
New	22929.004 22929.007	(D,,H.Weigmann+,J,PR/C, 14,1328,1976)	Embedded blanks in code (volume field)
Corr.	A0234.001	(R,,C.M.LEDERER+,B,LEDERER-7,78)	Book code (LEDERER- 7) and date should be separated by two commas
Corr.	A0253.001	(N,,M.BLANN,R,COO-3494-29)	Missing date subfield
09	M0635.023	See below	
Corr.	O1228.001	(C,2004BORMIO,,303,2004)	Subaccession# field is omitted but following comma should always be included
Corr.	V0015.007	(E,,M.C.MARTIN+,R,LASL-P-3-76,54)	Unknown report code in dic 6

Subentry M0635.023

REL-REF	(E, L0027009, A. LEPRETRE+, J, NP/A, 175, 609, 1971) (E, 0027010 , A. LEPRETRE+, J, NP/A, 175, 609, 1971) (E, L0011003, B. L. BERMAN+, J, PR, 162, 1098, 1967) (E, L0011004, B. L. BERMAN+, J, PR, 162, 1098, 1967)	M
---------	---	---

List of REL-REF referencing subentries which were renamed/moved/not present in Backup (this list was done with JANIS relational database):

		Bad REL-REF referenced Subentry	Should be replaced with
New	V0008.002	70107	31107
New	V0009.002	80017	40385
New		80265	40808
New	V0012.001	80073	40683
New	V0015.005	80021	40392
New		80233	40785
New		80263	40806
New	V0021.002	80025	40411
New	V0029.002	80078	40686

New	V0033.002	80217	40779
New	V0035.002	80137	40741
New	V0036.001	80258	40803
New	V0037.002	80029	40424
New		80042	40638
New		80061	40653
New		80136	40730

U. SAMPLE keyword

3 subentries contain an opening parenthesis in column 12, and this is explicitly forbidden:

“Free text may be entered in columns 12-66 under each of the information-identifier keywords in the BIB section and may be continued onto any number of records. It may include parentheses, if necessary, although, in general, a left parenthesis in the text must not be used in column 12 (as this implies the opening parenthesis of coded information)”

- 31515.001: 09
- 40105.007: 09
- D0282.001: Corr.

On the other hand the keyword SAMPLE cannot contain coded information (only free text).

JANIS has been changed so that this rule is not enforced for keyword which does not allow coded information.

V. STATUS keyword

All 2008 errors were corrected.

	Subentry	Code	Comment
Corr.	22683.002	(COREL,22844OO2)	Wrong subaccession#, 'O' (letter) should be replaced by '0' (digit)
Corr.	22683.003	(COREL,22844OO3)	
Corr.	22683.004	(COREL,22683006) (COREL,22844OO4)	
Corr.	22683.006	(COREL,22683004) (COREL,22844OO4)	

W. TITLE keyword

Note: these errors were not found in the Import log but rather in the EXFOR files while checking its content. So contrary to other tables this one is probably not exhaustive.

	Entry	Error	Comment
New	12689	The word 'THE' is repeated	Remove the second word 'THE'
New	12814	The word 'PARTICLE' is repeated	Remove the second word 'PARTICLE'
New	20803	Title is in German	Translation is given below table
New	21579	The word 'AND' is repeated	Remove the second word 'AND'
New	22012	Title is in German	Translation is given below table
New	22037	Title is in German	Translate in English
New	30563	Title is too long	Move 'SUMMARY OF CONTENTS' in COMMENT keyword
New	32514	The word 'REACTIONS' is repeated	Remove the second word 'REACTIONS'
New	32657	The word 'and' is repeated	Remove the second word 'and'
New	40420	The word 'OF' is repeated	Remove the second word 'OF'
New	41322	The word 'OF' is repeated	Remove the second word 'OF'
New	41331	The word 'NEUTRON' is repeated	Remove the second word 'NEUTRON'
New	A0120	Title is in German	Translation is given below table
New	A0345	Title is in French	Translate in English
New	A0639	Title is too long	Move abstract part in COMMENT keyword
New	B0013	Title is in French	Translation is given below table
New	C0062	Title is in French	Translation is given below table
New	C0316	The word 'from' is repeated	Remove the second word 'from'
New	C1332	Title is in French	Translation is given below table
New	L0126	Title is in French	Translate in English
New	M0461	Title is in German	Translation is given below table
New	M0519	The word 'FROM' is repeated	Remove the second word 'FROM'
New	M0625	Title is in German	Translation is given below table
New	O0113	Title is in French	Translation is given below table
New	O0285	Title is in French	Translation is given below table
New	O0342	Title is in French	Translation is given below table

New	P0033	Title is in German	Translation is given below table
New	R0015	Title is in French	Translate in English

Translations in English were obtained from <http://www.osti.gov/energycitations/> (Energy Citations Database).

20803: Investigation of excited nuclear states in Zn-68 by neutron capture in Zn-67

22012: Measurements of Cross Sections for the Reactions Al-27(n,p)Mg-27, Al-27(n,a)Na-24 and Al-27(n,a)Na-24-M in the Energy Region between 6.3 MeV and 8.3 MeV

A0120: Measurement and analysis of the angular distribution and effective cross section of the F-19(p,a)O-16 reaction in the energy range 0.4 to 0.72 MeV

B0013: Determination of the intensity of a beam of deuterons extracted from a synchrotron and measurement of the cross sections for the C-12(d,p2n)C-11 and Al-27(d,3p2n)Na-24 reactions at 2.33 GeV

C0062: The reactions (p,n) and (p,pn) induced at medium energies in light nuclei

C1332: Scattering of polarized protons on Mg-24, Al-27, and S-32 and anomalies in the giant resonance region of Al-25, of Si-28, and of Cl-33

M0461: Nuclear photoeffect in tritium

M0625: The energy spectra of alpha-particles in nuclear photo processes on Ti, Ni, Cu, and Nb

O0113: Study of the reactions of 400 MeV protons on intermediate mass nuclei by a proton-gamma coincidence experiment

O0285: Elastic and inelastic scattering of 155-MeV protons on Pb-208

O0342: Contribution to the study of double indirect pickup: measurement of tritium production by 82- and 105-MeV protons on several targets

P0033: Excitation functions and cross sections of the (p,n) reaction. II

III. DATA sections

A. Suspicious numerical values

	Subentry	Current value	Comments
Corr.	22307.016	Only a dot character	In DATA and MONIT columns, first Empty point: remove row
Corr.	22393.009		In DATA column, ERR-T=0. Empty point: remove row
Corr.	22405.003 22405.005 22405.006		In DATA column, ERR-T and FLAG not empty for these points Leave field empty
09	40937.047		In DATA column, ERR-S and FLAG not empty for this point Leave field empty
09	40962.003 40962.005		In DATA column, DATA-ERR and E-LVL-INI/E-LVL-FIN not empty for these points Leave field empty
09	41186.039		In ERR-T column Leave field empty
09	41191.002		In DATA and MISC column, SPIN J not empty for this point Leave fields empty
Corr.	C0765.032		In Data column, ERR-S not empty for this point Leave field empty
09	41389.005		-. In DATA column, ERR-S empty for this point
Corr.	D4151.002		7.06+ In ERR-T column, see below
Corr.	13346.002	1.64E -05 Two points given with "E", others without To be considered as legal? Even with only two occurrences in EXFOR...	
09	T0034.004	5.03 - "- " sign probably in the wrong column for 8 points Affect DATA-CM sign for these 8 points	
Corr.	C1291.006	0.045 - "- " sign probably in the wrong column for 3 points Affect DATA sign for these 3 points	

Subentry T0034.004:

SUBENT	T0034004	19990708	19990901	20050926	0000
BI B	2	3			
REACTION	(3-LI -7(A, N)5-B-10, , DA, , LEG)				
STATUS	(DEP, T0034003)				
	(COREL, T0034004)				
ENDBI B	3				
NOCOMMON	0	0			
DATA	4	177			
NUMBER-CM	EN	DATA-CM	DATA-ERR		
NO-DIM	MEV	MU-B/SR	MU-B/SR		
1.	4. 43	-49.	22.		
1.	4. 44	-33.	30.		
1.	4. 45	3.	37.		

1.	4. 46	51.	44.
...			
1.	5. 01	-957.	58.
1.	5. 02	-992.	60.
1.	5. 03	- 1052.	62.
1.	5. 04	- 1108.	65.
1.	5. 05	- 1147.	67.
1.	5. 06	- 1166.	68.
1.	5. 07	- 1185.	70.
1.	5. 08	- 1201.	71.
1.	5. 09	- 1203.	71.
1.	5. 10	- 1162.	71.
2.	4. 56	82.	37.
2.	4. 57	83.	42.
...			
4.	5. 08	221.	109.
4.	5. 09	222.	109.
4.	5. 10	224.	109.
ENDDATA		179	
ENDSUBENT		187	

B. Unknown data heading, data units codes

	Subentry	Heading codes	Comment
New	41516.004 41516.005	ANG-RL-DN ANG-RL-NM	Only ANG-RL is defined, addition to dictionary 24?
New	41516.006	P/FS/MEVSR	Addition to dictionary?
09	C0316.002	E2-RL	EN-SEC keyword gives the following meaning to the column: "Relative energy of 2 detected alphas" Addition to dictionary 24?
Corr.	A0540.002	ANG-DN-CM ANG-NM-CM	Correct heading codes are ANG-CM-DN and ANG-CM-NM.
Corr.	M0739.001	ANG1-MIN ANG1-MAX ANG2-MIN	Only ANG-MIN and ANG-MAX are given in dict 24. Addition to dictionary 24?
Corr.	M0740.001	ANG2-MAX	