Nuclear Data Section
International Atomic Energy Agency
P.O.Box 100, A-1400 Vienna, Austria

Memo CP-D/509

Date: 24 July 2008
To: Distribution
From: N.Otsuka, S.Dunaeva

Subject: Reaction product (SF4) field for quantities at resonance

In EXFOR, we have following rules about resonance parameters:

1) Resonance parameters are flagged with a "**.**" in dictionary 236;

2) There is no reaction product (SF4) given if the reaction specifies a resonance parameter;

3) For resonance parameters, resonance energy is specified. It is coded either under the data heading EN-RES, or, if coded under REACTION (specified by the code EN given in REACTION SF6), under the heading DATA.

All resonance parameters defined in dictionary 236 by resonance flag "." are summarized in next page. Some codes (e.g. cross section at resonance) are for "quantities given at resonances" rather than "resonance parameters", and it would be useful to give reaction product in SF4 for such quantities. Therefore we propose

1) to change reaction type of cross section and partial cross section at resonance from RP and RPP to CSR (cross section at resonance) and CRP (partial cross section at resonance), respectively.

2) to remove resonance flags of quantity codes which reaction types are other than RP, RPP, RE or RPE.

Dictionary 213 (Reaction type)

CSR	Cross section at resonance
CRP	Partial cross section at resonance

Reaction Type	CINDA quantity	Independent variable family flag(s)
CSR	CS	1
CRP	CSP	1, 3

Example (30092.003)

8-O-16(N,A),,SIG,,RES → 8-O-16(N,A)6-C-13,,SIG,,RES

Resonance parameters defined in dictionary 236
(Type = reaction type, Flag = resonance flag)

Code	Type	Dim.	Expansion	Proposal	
				Flag	Type
,AG,,AA	RP	BERE	Adler-Adler symmetry coefficient	Y	RP
,AH,,AA	RP	BERE	Adler-Adler asymmetry coefficient	Y	RP
,AKE,*,RES	RPE	E	Average kinetic en. of specif.part. at reson.	**N**	RPE
,ALF,,RES	ALR	NO	Capture-to-fission (alpha) ratio at resonance	**N**	ALR
,AP,*F,RES	APR	NO	Most probable mass of fragment specif.at reson.	**N**	APR
,ARE	RP	B*E	Resonance area	Y	RP
,ARE,,RTE	RP	BERE	Resonance area * square root(E)	Y	RP
,D	RP	E	Average level spacing	Y	RP
,EN	RE	E	Resonance energy	Y	RE
,EN,,AA	RE	E	Adler-Adler resonance energy	Y	RE
,ETA,,RES	ETR	NO	Eta at resonance	**N**	ETR
,ETA/NU,,RES	ETR	NO	Eta/Nu at resonance	**N**	ETR
,INT,,RES	ITR	B*E	Cross-section integral over inc. energy at res.	**N**	ITR
,J	RP	NO	Spin J	Y	RP
,L	RP	NO	Momentum L	Y	RP
,MLT,G,RES	MTR	YLD	Average particle multiplicity at resonance	**N**	MTR
,NU,,RES	NUR	FY	Total Nu-bar at resonance	**N**	NUR
,PHS,,VGT	RP	A	Vogt relative phase	Y	RP
,PTY	RP	NO	Parity	Y	RP
,SIG,,RES	RP	B	Cross section at resonance	**N**	**CSR**
,SIG,,RES/RTE	RP	BRE	Cross section * square root(E) at resonance	**N**	**CSR**
,SIG,,SFC/RES	RP	B*E	S-factor for cross section at resonance	**N**	**CSR**
,SPC,,RES	SPR	YLD	Gamma spectrum at resonance	**N**	SPR
,SPC,,TT	SP	YLD	Gamma spectrum for thick target	**N**	SP
,STF	RP	NO	Strength function	Y	RP
,SWG	RP	NO	Statistical weight factor g	Y	RP
,WID	RP	E	Resonance width	Y	RP
,WID,,2AG	RP	E	2ag * resonance width	Y	RP
,WID,,2G	RP	E	2g * resonance width	Y	RP
,WID,,4AG	RP	E	4ag * resonance width	Y	RP
,WID,,AA	RP	E	Adler-Adler Nu	Y	RP
,WID,,AG	RP	E	ag * resonance width	Y	RP
,WID,,G	RP	E	g * resonance width	Y	RP
,WID,,RM	RP	E	Reich-Moore resonance width	Y	RP
,WID,,RM/G	RP	E	g * Reich-Moore resonance width	Y	RP

,WID,,RM/SQ/G	RP	E2	g * Reich-Moore resonance width squared	Y	RP
,WID,,S0	RP	B*E	Resonance width * peak cross section	Y	RP
,WID,,SQ	RP	E2	Resonance width squared	Y	RP
,WID,,SQ/G	RP	E2	g * resonance width squared	Y	RP
,WID,,SQ/S0	RP	BE2	Resonance width squared * peak cross section	Y	RP
,WID,,VGT	RP	E	Vogt resonance width	Y	RP
,WID,,VGT/2G	RP	E	2g * Vogt resonance width	Y	RP
,WID/RED	RP	E	Reduced width	Y	RP
,WID/RED,,2AG	RP	E	2ag * reduced width	Y	RP
,WID/RED,,2G	RP	E	2g * reduced width	Y	RP
,WID/RED,,4AG	RP	E	4ag * reduced width	Y	RP
,WID/RED,,AG	RP	E	ag * reduced width	Y	RP
,WID/RED,,G	RP	E	g * reduced width	Y	RP
,WID/RED,,RM	RP	E	Reich-Moore reduced resonance width	Y	RP
,WID/RED,,RM/2G	RP	E	2g * Reich-Moore reduced resonance width	Y	RP
,WID/RED,,RMT	RP	E	R-matrix reduced resonance width	Y	RP
,WID/RED,,RMT/AMP	RP	RE	R-matrix reduced width amplitude	Y	RP
,WID/RED,,VGT	RP	E	Vogt reduced resonance width	Y	RP
,WID/STR	RP	E	Resonance strength	Y	RP
,WID/STR,,RG	RP	E	Resonance strength * (2J(i)+1)*(2J(j)+1)	Y	RP
1,WID,,RM	RP	E	Reich-Moore resonance width for channel 1	Y	RP
1,WID,,VGT	RP	E	Vogt resonance width for channel 1	Y	RP
2,WID,,RM	RP	E	Reich-Moore resonance width for channel 2	Y	RP
2,WID,,VGT	RP	E	Vogt resonance width for channel 2	Y	RP
3,WID,,RM	RP	E	Reich-Moore resonance width for channel 3	Y	RP
4,WID,,RM	RP	E	Reich-Moore resonance width for channel 4	Y	RP
EP,STF	RPP	NO	Strength function for electr.polarity given	Y	RPP
MP,STF	RPP	NO	Strength function for magnetic polarity given	Y	RPP
PAR,DA,,RES	DPR	DA	Partial diff. cross section at resonance	**N**	DPR
PAR,MLT,,RES	PZR	YLD	Partial multiplicity at resonance	**N**	PZR
PAR,MLT,*,RES	PZR	YLD	Partial multiplicity of part.spec. at resonance	**N**	PZR
PAR,SIG,,RES	RPP	B	Partial cross section at resonance	**N**	**CRP**
PAR,STF	RPP	NO	Partial strength function	Y	RPP
PAR,WID	RPP	E	Partial width	Y	RPP
PAR,WID,,G	RPP	E	g * partial width	Y	RPP
PAR,WID/RED,,RMT	RPP	E	R-matrix red.resonance width	Y	RPP

			f.partial reaction		
PAR,WID/STR	RPP	E	Partial resonance strength	Y	RPP
PAR,WID/STR,,RG	RPP	E	Partial Resonance strength * (2J(i)+1)*(2J(j)+1)	Y	RPP
PR,NU,,RES	NUR	FY	Prompt Nu-bar at resonance	**N**	NUR
TER,SIG,,RES	RP	B	Ternary fission cross section at resonance	**N**	**CSR**
TER/BIN,SIG/RAT,,RES	RP	NO	Ternary/binary cross section ratio at resonance	**N**	**CSR**

Distribution:

a.mengoni@iaea.org
a.nichols@iaea.org
blokhin@ippe.ru
chiba@earth.sgu.ac.jp
claes.nordborg@oecd.org
ganesan@barc.gov.in
gezg@ciae.ac.cn
hasegawa@nea.fr
henriksson@near.fr
hongwei@ciae.ac.cn
jhchang@kaeri.re.kr
kaltchenko@kinr.kiev.ua
katakura.junichi@jaea.go.jp
kato@nucl.sci.hokudai.ac.jp
kirarlyb@atomki.hu
l.vrapcenjak@iaea.org
manokhin@ippe.ru
mmarina@ippe.ru
mwherman@bnl.gov
nklimova@kinr.kiev.ua
n.otsuka@iaea.org
nrdc@jcprg.org
oblozinsky@bnl.gov
ogritzay@kinr.kiev.ua
samaev@obninsk.ru
s.babykina@polyn.kiae.su
s.dunaeva@iaea.org
stakacs@atomki.hu
stanislav.hlavac@savba.sk
taova@exped.vniief.ru
tarkanyi@atomki.hu
varlamov@depni.sinp.msu.ru
vlasov@kinr.kiev.ua
vmclane@optonline.net
v.zerkin@iaea.org
yolee@kaeri.re.kr