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To: Distribution
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Subject: Compilation of light-ion induced neutron spectra for application

Neutrons generation from light-ion induced reactions on light element targets (e.g., ^{7}Li(p,xn), ^{7}Li(p,xn), ^{9}Be(d,xn)) have been recognized as practical useful neutron fields for cross section measurements, detector calibrations, material irradiation and validation of the neutron transport through the shields. Theoretical modeling of the differential cross sections for these reactions faces with difficulties and incapability to verify models against experimental data. This resulted to unavailability of complete evaluated nuclear data files for many neutron production reactions. Therefore the collection of experimental numerical spectra in EXFOR will have high importance.

There are still many experimental works missed in the EXFOR database. Many measurements were done and published in period 1960-1980. Data there are usually presented as numerous data points (and not always point-wise) in the figures. Compilation of all relevant data by priority is proposed.

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Experimental neutron spectra and angular distributions from thick Li and other targets bombarded with light charged-particle ("Table" in source means data from authors are available)

(2011-03-01)

Targ.	Proj.	Unit	Emin (eV)	Emax (eV)	Lab.	Author	Publication	Vol	Page	Year	Source	Centre	Additional reference
Li	d	PYT2	1.5+7	2.3+7	1CACCRC	M.A.Lone+	J,NIM	143	331	1977	Point	NNDC	NBIR-77-1279,5,1977
Li	p	PYT2	1.5+7	2.3+7	1CACCRC	M.A.Lone+	J,NIM	143	331	1977	Point	NNDC	NBIR-77-1279,5,1977
Be9	d	PYT2	1.5+7	2.3+7	1CACCRC	M.A.Lone+	J,NIM	143	331	1977	Point	NNDC	NBIR-77-1279,5,1977
Be9	p	PYT2	1.5+7	2.3+7	1CACCRC	M.A.Lone+	J,NIM	143	331	1977	Point	NNDC	NBIR-77-1279,5,1977
Li	d	PYTA	1.5+7	2.3+7	1CACCRC	M.A.Lone+	J,NIM	143	331	1977	Point	NNDC	NBIR-77-1279,5,1977
Li	p	PYTA	1.5+7	2.3+7	1CACCRC	M.A.Lone+	J,NIM	143	331	1977	Point	NNDC	NBIR-77-1279,5,1977
Be9	d	PYTA	1.5+7	2.3+7	1CACCRC	M.A.Lone+	J,NIM	143	331	1977	Point	NNDC	NBIR-77-1279,5,1977
Be9	p	PYTA	1.5+7	2.3+7	1CACCRC	M.A.Lone+	J,NIM	143	331	1977	Point	NNDC	NBIR-77-1279,5,1977
Li	p	arb.	3.5+7	6.5+7	1USADAV	H.I.Amols+	J,MED	4	486	1977	Curve	NNDC	
Li	d	arb.	3.5+7		1USADAV	H.I.Amols+	J,MED	4	486	1977	Curve	NNDC	
Li	p	PYTA	3.5+7	6.5+7	1USADAV	H.I.Amols+	J,MED	4	486	1977	Table	NNDC	
Li	d	PYTA	3.5+7		1USADAV	H.I.Amols+	J,MED	4	486	1977	Table	NNDC	
Li	d	PYT2	3.5+7		1USADAV	D.L.Johnson+	J,JNM	85-86	467	1979	Curve	NNDC	BNL-NCS-51245,99,1980
Li	d	PYTA	3.5+7		1USADAV	D.L.Johnson+	J,JNM	85-86	467	1979	Point	NNDC	BNL-NCS-51245,99,1980
Be9	d	DAE	8.8+6	1.8+7	1USALRL	K.A.Weaver+	J,NSE	52	35	1973	Point	F0218.002	UCRL-51310,1972
Be9	d	PYT2	8.8+6	1.8+7	1USALRL	K.A.Weaver+	J,NSE	52	35	1973	Point	F0218.003	UCRL-51310,1972
C	d	PYT2	1.8+7		1USALRL	K.A.Weaver+	J,NSE	52	35	1973	Point	F0218.005	UCRL-51310,1972
Li	d	PYT2	1.9+7		1USALRL	K.A.Weaver+	J,NSE	52	35	1973	Point	F0218.004	UCRL-51310,1972
2H	d	DAE	1.9+7		1USALRL	K.A.Weaver+	J,NSE	52	35	1973	Point	F0218.006	UCRL-51310,1972
Be9	d	DA	4.0+6	1.8+7	1USALRL	K.A.Weaver+	J,NSE	52	35	1973	Point	F0218	UCRL-51310,1972
Be9	d	PYTA	3.0+6	2.0+7	1USALRL	K.A.Weaver+	J,NSE	52	35	1973	Point	F0218	UCRL-51310,1972
Li	d	PYTA	5.0+6	1.9+7	1USALRL	K.A.Weaver+	J,NSE	52	35	1973	Point	F0218	UCRL-51310,1972

C	d	PYTA	1.2+7	1.8+7	1USALRL	K.A.Weaver+	J,NSE	52	35	1973	Point	F0218	UCRL-51310,1972
2H	d	DA	1.7+7	1.9+7	1USALRL	K.A.Weaver+	J,NSE	52	35	1973	Point	CNPD	UCRL-51310,1972
2H	d	PYTA	8.0+6	1.9+7	1USALRL	K.A.Weaver+	J,NSE	52	35	1973	Table	CNPD	UCRL-51310,1972
Li	d	PYT2	1.3+7	3.4+7	1USANRL	A.N.Goland+	J,IRE	22	1776	1975	Point	NNDC	
Li	d	PYTA	1.3+7	3.4+7	1USANRL	A.N.Goland+	J,IRE	22	1776	1975	Table	NNDC	
Li	d	PYT2	3.5+7		1USANRL	L.S.August+	R,NBSIR	77-1279	31	1977	Point	NNDC	
Be9	h	PYT2	8.1+7		1USANRL	L.S.August+	R,NBSIR	77-1279	31	1977	Point	NNDC	
Be9	d	PYT2	4.0+7		1USAORL	M.J.Saltmarsh+	J,NIM	145	81	1977	Point	NNDC	NBIR-77-1279,24,1977
Be9	d	PYTA	4.0+7		1USAORL	M.J.Saltmarsh+	J,NIM	145	81	1977	Table	NNDC	NBIR-77-1279,24,1977
Li	d	PYT2	8.0+6	1.5+7	1USATNL	C.E.Nelson+	R,NBSIR	77-1279	1	1977	Point	NNDC	
Li	p	PYT2	1.5+7		1USATNL	C.E.Nelson+	R,NBSIR	77-1279	1	1977	Point	NNDC	
Li	d	PYTA	8.0+6	1.5+7	1USATNL	C.E.Nelson+	R,NBSIR	77-1279	1	1977	Table	NNDC	
Li	p	PYTA	1.5+7		1USATNL	C.E.Nelson+	R,NBSIR	77-1279	1	1977	Table	NNDC	
Be9	d	PYT2	1.6+7	5.0+7	2BLGLVN	J.P.Meulders+	J,PMB	20	235	1975	Histgram	NEA DB	
12C	d	PYT2	1.6+7	5.0+7	2BLGLVN	J.P.Meulders+	J,PMB	20	235	1975	Histgram	NEA DB	
Cu	d	PYT2	1.6+7	5.0+7	2BLGLVN	J.P.Meulders+	J,PMB	20	235	1975	Histgram	NEA DB	
Mo	d	PYT2	1.6+7	3.3+7	2BLGLVN	J.P.Meulders+	J,PMB	20	235	1975	Histgram	NEA DB	
Ta181	d	PYT2	3.3+7	5.0+7	2BLGLVN	J.P.Meulders+	J,PMB	20	235	1975	Histgram	NEA DB	
Au197	d	PYT2	1.6+7	5.0+7	2BLGLVN	J.P.Meulders+	J,PMB	20	235	1975	Histgram	NEA DB	
Be9	d	PYTA	1.6+7	5.0+7	2BLGLVN	J.P.Meulders+	J,PMB	20	235	1975	Table	NEA DB	
C12	d	PYTA	1.6+7	5.0+7	2BLGLVN	J.P.Meulders+	J,PMB	20	235	1975	Table	NEA DB	
Cu	d	PYTA	1.6+7	5.0+7	2BLGLVN	J.P.Meulders+	J,PMB	20	235	1975	Table	NEA DB	
Mo	d	PYTA	1.6+7	3.3+7	2BLGLVN	J.P.Meulders+	J,PMB	20	235	1975	Table	NEA DB	
Ta181	d	PYTA	1.6+7	5.0+7	2BLGLVN	J.P.Meulders+	J,PMB	20	235	1975	Table	NEA DB	
Au197	d	PYTA	1.6+7	5.0+7	2BLGLVN	J.P.Meulders+	J,PMB	20	235	1975	Table	NEA DB	
Be9	d	PYT2	4.0+7	5.4+7	2GERKFK	G.W.Schweimer	J,NP/A	100	537	1967	Table	NEA DB	

C	d	PYT2	4.0+7	5.4+7	2GERKFK	G.W.Schweimer	J,NP/A	100	537	1967	Table	NEA DB	
Al	d	PYT2	4.0+7	5.4+7	2GERKFK	G.W.Schweimer	J,NP/A	100	537	1967	Table	NEA DB	
Fe	d	PYT2	5.4+7		2GERKFK	G.W.Schweimer	J,NP/A	100	537	1967	Table	NEA DB	
Co	d	PYT2	5.4+7		2GERKFK	G.W.Schweimer	J,NP/A	100	537	1967	Table	NEA DB	
Ni	d	PYT2	5.4+7		2GERKFK	G.W.Schweimer	J,NP/A	100	537	1967	Table	NEA DB	
Cu	d	PYT2	4.0+7	5.4+7	2GERKFK	G.W.Schweimer	J,NP/A	100	537	1967	Table	NEA DB	
Nb	d	PYT2	5.4+7		2GERKFK	G.W.Schweimer	J,NP/A	100	537	1967	Table	NEA DB	
Mo	d	PYT2	5.4+7		2GERKFK	G.W.Schweimer	J,NP/A	100	537	1967	Table	NEA DB	
Pd	d	PYT2	5.4+7		2GERKFK	G.W.Schweimer	J,NP/A	100	537	1967	Table	NEA DB	
Ag	d	PYT2	4.0+7	5.4+7	2GERKFK	G.W.Schweimer	J,NP/A	100	537	1967	Table	NEA DB	
Ta	d	PYT2	5.4+7		2GERKFK	G.W.Schweimer	J,NP/A	100	537	1967	Table	NEA DB	
Pt	d	PYT2	5.4+7		2GERKFK	G.W.Schweimer	J,NP/A	100	537	1967	Table	NEA DB	
Au197	d	PYT2	4.0+7	5.4+7	2GERKFK	G.W.Schweimer	J,NP/A	100	537	1967	Table	NEA DB	
Be9	d	PYTA	9.4+6	1.4+7	2GERKFK	H.J.Brede+	J,NIM/A	274	332	1989	Table	D0523	
Be9	p	PYTA	1.7+7	2.2+7	2GERKFK	H.J.Brede+	J,NIM/A	274	332	1989	Table	D0523.004	
Li	d	PYT2	3.2+7		2JPN?	M.Sugimoto+	Priv. Comm.			1995	Table	JCPRG	Missing,
LI	d	PYT2	7.0+7	2.1+8	2JPNIPC	N.Nakao+	J,NIM/A	420	218	1999	Table	E2298	in compilation
Li	d	PYT2	4.0+7	9.0+7	2JPNJAE	M.Baba+	J,NIM/A	428	454	1999	Table	E1808.003	in compilation
Li	d	PYT2	2.5+8	3.9+8	2JPNOSA	Y.Iwamoto+	J,NIM/B	629	43	2011	Table	E2297.002	in compilation
Li	d	PYT2	2.0+7	4.0+7	2JPNTOH	Y.Uwamino+	J,NIM/A	389	463	1997	Table	E1826.005	in compilation
Li	d	DAE	2.5+7		2JPNTOH	M.Hagiwara+	J,JNM	in press			Table	E2322	
Li	d	DA	2.5+7		2JPNTOH	M.Hagiwara+	J,JNM	in press			Table	E2322	
Li	d	CS		4.0+7	2JPNTOH	M.Hagiwara+	J,JNM	in press			Table	E2323	
Li	d	TTT	4.0+7		2JPNTOH	M.Hagiwara+	J,JNM	in press			Table	E2323	
Al27	d	TTT	4.0+7		2JPNTOH	M.Hagiwara+	J,JNM	in press			Table	E2323	
C	d	TTT	4.0+7		2JPNTOH	M.Hagiwara+	J,JNM	in press			Table	E2323	

C	p	PYT2	5.0+7		2JPNTOH	M.Baba+	C,2004SANTA	1	884	2004	Table	E1856	
C	p	PYT2	7.0+7		2JPNTOH	M.Baba+	C,2004SANTA	1	884	2004	Point	JCPRG	
W	p	PYT2	5.0+7		2JPNTOH	M.Baba+	C,2004SANTA	1	884	2004	Table	E1856	
W	p	PYT2	7.0+7		2JPNTOH	M.Baba+	C,2004SANTA	1	884	2004	Point	JCPRG	
Li	d	PYT2	4.0+7		2JPNTOH	M.Baba+	C,2004SANTA	1	884	2004	Table	E1986.002	
Li	d	DAE	4.0+7		2JPNTOH	M.Baba+	C,2004SANTA	1	884	2004	Table	E1986.005	
Li	p	DAE	7.0+7		2JPNTOH	M.Baba+	C,2004SANTA	1	884	2004	Plot	JCPRG	E2110?
Li	d	CS	7.0+6	4.0+7	2JPNTOH	M.Baba+	C,2004SANTA	1	884	2004		JCPRG	E2323?
Li	d	TTT	4.0+7		2JPNTOH	M.Baba+	C,2004SANTA	1	884	2004		JCPRG	E2323?
Li	d	PYT2	2.5+7		2JPNTOH	M.Baba+	J,JNM	307-311	1715	2002	Table	E1893	
Li	d	TTT	2.5+7		2JPNTOH	M.Baba+	J,JNM	307-311	1715	2002	Table	E1893.002	
C	d	PYT2	4.0+7		2JPNTOH	M.Hagiwara+	J,JNM	329-333	218	2004	Table	E1985.002	
Al27	d	PYT2	4.0+7		2JPNTOH	M.Hagiwara+	J,JNM	329-333	218	2004	Table	E1985.003	
Al27	d	CS	2.1+7	3.9+7	2JPNTOH	M.Hagiwara+	J,JNM	329-333	218	2004	Table	E1985	
C	d	CS	2.3+7	4.0+7	2JPNTOH	M.Hagiwara+	J,JNM	329-333	218	2004	Table	E1985.007	
Li	d	PYT2	2.5+7		2JPNTOH	T.Aoki+	J,NST	41	399	2004	Table	E1893	
Be9	d	PYT2	2.5+7		2JPNTOH	T.Aoki+	J,NST	41	399	2004	Table	E1893	
Li	d	TTT	2.5+7		2JPNTOH	T.Aoki+	J,NST	41	399	2004	Table	E1893.022	
Be9	d	TTT	2.5+7		2JPNTOH	T.Aoki+	J,NST	41	399	2004	Table	E1893.023	
Li	d	PYT2	4.0+7		2JPNTOH	M.Hagiwara+	J,FST	48	1320	2005	Table	E1986.002	
Li	d	PYTA	4.0+7		2JPNTOH	M.Hagiwara+	J,FST	48	1320	2005	Table	E1986.003	
Li	d	PYT	4.0+7		2JPNTOH	M.Hagiwara+	J,FST	48	1320	2005	Table	E1986.004	
Li	d	DAE	4.0+7		2JPNTOH	M.Hagiwara+	J,FST	48	1320	2005	Table	E1986.005	
Be9	d	PYT2	2.0+7	4.0+7	2JPNTOK	Y.Uwamino+	J,NIM/A	271	546	1988	Point	E2296	in compilation
C	d	1/AE	3.3+7		2JPNTOK	K.Shin+	J,PR/C	29	1307	1984	Point	JCPRG	
Cu	d	1/AE	3.3+7		2JPNTOK	K.Shin+	J,PR/C	29	1307	1984	Point	JCPRG	

Pb	d	1/AE	3.3+7		2JPNTOK	K.Shin+	J,PR/C	29	1307	1984	Point	JCPRG	
C	h	1/AE	6.5+7		2JPNTOK	K.Shin+	J,PR/C	29	1307	1984	Point	JCPRG	
Cu	h	1/AE	6.5+7		2JPNTOK	K.Shin+	J,PR/C	29	1307	1984	Point	JCPRG	
Pb	h	1/AE	6.5+7		2JPNTOK	K.Shin+	J,PR/C	29	1307	1984	Point	JCPRG	
C	a	1/AE	6.5+7		2JPNTOK	K.Shin+	J,PR/C	29	1307	1984	Point	JCPRG	
Cu	a	1/AE	6.5+7		2JPNTOK	K.Shin+	J,PR/C	29	1307	1984	Point	JCPRG	
Pb	a	1/AE	6.5+7		2JPNTOK	K.Shin+	J,PR/C	29	1307	1984	Point	JCPRG	
C	d	1/A	3.3+7		2JPNTOK	K.Shin+	J,PR/C	29	1307	1984	Point	JCPRG	
Cu	d	1/A	3.3+7		2JPNTOK	K.Shin+	J,PR/C	29	1307	1984	Point	JCPRG	
Pb	d	1/A	3.3+7		2JPNTOK	K.Shin+	J,PR/C	29	1307	1984	Point	JCPRG	
C	p	1/A	3.0+7		2JPNTOK	K.Shin+	J,PR/C	29	1307	1984	Point	JCPRG	
Cu	p	1/A	3.0+7		2JPNTOK	K.Shin+	J,PR/C	29	1307	1984	Point	JCPRG	
Fe	p	1/A	3.0+0		2JPNTOK	K.Shin+	J,PR/C	29	1307	1984	Point	JCPRG	
Pb	p	1/A	3.0+7		2JPNTOK	K.Shin+	J,PR/C	29	1307	1984	Point	JCPRG	
C	d	1/A	3.3+7		2JPNTOK	K.Shin+	J,PR/C	29	1307	1984	Point	JCPRG	
Cu	d	1/A	3.3+7		2JPNTOK	K.Shin+	J,PR/C	29	1307	1984	Point	JCPRG	
Fe	d	1/A	3.3+7		2JPNTOK	K.Shin+	J,PR/C	29	1307	1984	Point	JCPRG	
Pb	d	1/A	3.3+7		2JPNTOK	K.Shin+	J,PR/C	29	1307	1984	Point	JCPRG	
C	h	1/A	6.5+7		2JPNTOK	K.Shin+	J,PR/C	29	1307	1984	Point	JCPRG	
Cu	h	1/A	6.5+7		2JPNTOK	K.Shin+	J,PR/C	29	1307	1984	Point	JCPRG	
Fe	h	1/A	6.5+7		2JPNTOK	K.Shin+	J,PR/C	29	1307	1984	Point	JCPRG	
Pb	h	1/A	6.5+7		2JPNTOK	K.Shin+	J,PR/C	29	1307	1984	Point	JCPRG	
C	a	1/A	6.5+7		2JPNTOK	K.Shin+	J,PR/C	29	1307	1984	Point	JCPRG	
Cu	a	1/A	6.5+7		2JPNTOK	K.Shin+	J,PR/C	29	1307	1984	Point	JCPRG	
Fe	a	1/A	6.5+7		2JPNTOK	K.Shin+	J,PR/C	29	1307	1984	Point	JCPRG	
Pb	a	1/A	6.5+7		2JPNTOK	K.Shin+	J,PR/C	29	1307	1984	Point	JCPRG	

C	p	YLD	3.0+7		2JPNTOK	K.Shin+	J,PR/C	29	1307	1984	Table	JCPRG	
Cu	p	YLD	3.0+7		2JPNTOK	K.Shin+	J,PR/C	29	1307	1984	Table	JCPRG	
Fe	p	YLD	3.0+0		2JPNTOK	K.Shin+	J,PR/C	29	1307	1984	Table	JCPRG	
Pb	p	YLD	3.0+7		2JPNTOK	K.Shin+	J,PR/C	29	1307	1984	Table	JCPRG	
C	d	YLD	3.3+7		2JPNTOK	K.Shin+	J,PR/C	29	1307	1984	Table	JCPRG	
Cu	d	YLD	3.3+7		2JPNTOK	K.Shin+	J,PR/C	29	1307	1984	Table	JCPRG	
Fe	d	YLD	3.3+7		2JPNTOK	K.Shin+	J,PR/C	29	1307	1984	Table	JCPRG	
Pb	d	YLD	3.3+7		2JPNTOK	K.Shin+	J,PR/C	29	1307	1984	Table	JCPRG	
C	h	YLD	6.5+7		2JPNTOK	K.Shin+	J,PR/C	29	1307	1984	Table	JCPRG	
Cu	h	YLD	6.5+7		2JPNTOK	K.Shin+	J,PR/C	29	1307	1984	Table	JCPRG	
Fe	h	YLD	6.5+7		2JPNTOK	K.Shin+	J,PR/C	29	1307	1984	Table	JCPRG	
Pb	h	YLD	6.5+7		2JPNTOK	K.Shin+	J,PR/C	29	1307	1984	Table	JCPRG	
C	a	YLD	6.5+7		2JPNTOK	K.Shin+	J,PR/C	29	1307	1984	Table	JCPRG	
Cu	a	YLD	6.5+7		2JPNTOK	K.Shin+	J,PR/C	29	1307	1984	Table	JCPRG	
Fe	a	YLD	6.5+7		2JPNTOK	K.Shin+	J,PR/C	29	1307	1984	Table	JCPRG	
Pb	a	YLD	6.5+7		2JPNTOK	K.Shin+	J,PR/C	29	1307	1984	Table	JCPRG	
Be9	d	1/AE	6.5+7		2SF JVV	Z.Radivojevic+	J,NIM/B	183	212	2001	Table	O1050.003	
C	d	1/AE	5.0+7		2SF JVV	Z.Radivojevic+	J,NIM/B	183	212	2001	Table	O1050.002	
Be9	d	1/A	6.5+7		2SF JVV	Z.Radivojevic+	J,NIM/B	183	212	2001	Table	O1050.005	
C	d	1/A	5.0+7		2SF JVV	Z.Radivojevic+	J,NIM/B	183	212	2001	Table	O1050.004	
C	d	1/AE	4.0+7		2SF JVV	G.Lhersonneau+	J,NIM/A	603	228	2009	Point	O1746.002	
C	d	1/A	4.0+7		2SF JVV	G.Lhersonneau+	J,NIM/A	603	228	2009	Point	O1746.005.1	
C	d	YLD	4.0+7		2SF JVV	G.Lhersonneau+	J,NIM/A	603	228	2009	Point	O1746.008.1	
D2O	d	1/AE	4.0+7		2SF JVV	G.Lhersonneau+	J,NIM/A	603	228	2009	Point	O1746.002	
D2O	d	1/A	4.0+7		2SF JVV	G.Lhersonneau+	J,NIM/A	603	228	2009	Point	O1746.007.1	
D2O	d	YLD	4.0+7		2SF JVV	G.Lhersonneau+	J,NIM/A	603	228	2009	Point	O1746.010.1	

WTR	d	1/AE	4.0+7		2SF JVV	G.Lhersonneau+	J,NIM/A	603	228	2009	Point	O1746.004	
WTR	d	1/A	4.0+7		2SF JVV	G.Lhersonneau+	J,NIM/A	603	228	2009	Point	O1746.006.1	
WTR	d	YLD	4.0+7		2SF JVV	G.Lhersonneau+	J,NIM/A	603	228	2009	Point	O1746.009.1	
Li	d		1.6+7	1.7+7	3CZRUFJ	P.Bem+	Internal report					NDS	
Be9	d	PYT2	2.1+7		4RUSFEI	V.K.Daruga+	J,SJA	30	493	1971	Point	CAJaD	SJA,24,71,1968
Li	d	PYT2	2.1+7		4RUSFEI	V.K.Daruga+	S,SJA	30	493	1971	Point	CAJaD	SJA,24,71,1968