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COEFFICIENTS OF FRACTIONAL PARTENTAGE FOR $n \geq n-2$ FOR LIKE NUCLEONS

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A. A. Ross-Bonney

May 1970

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COEFFICIENTS OF FRACTIONAL PARENTAGE FOR $n \rightarrow n-2$ FOR LIKE NUCLEONS

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Berkeley, California

May 1970

ABSTRACT

Numerical values and useful recursion relations are given for $n \rightarrow n-2$ coefficients of fractional parentage in the case of like nucleons in j-j coupling. The maximum value of j for which calculations are included is $j = 9/2$.

Coefficients of Fractional Parentage for $n \rightarrow n-2$ for Like Nucleons

A. A. Ross-Bonney

Lawrence Radiation Laboratory and Department of Physics
University of California, Berkeley, California 94720I. Recursion Relations

In addition to the usual¹ recursion relations the following are also necessary in order to make full use of the tables.

$$[j^{n-2}(\nu+2J_f) j^2(J_2) J] \{ j^n \nu J \} = (-1)^{J-J_f+2j} \sqrt{\frac{(n-\nu)(n-\nu-2)(\nu+1)(\nu+2)(2J_f+1)}{n(n-1)(2j+1-2\nu)(2j-1-2\nu)(2J+1)}} \\ \times [j^\nu(\nu J) j^2(J_2) J_f] \{ j^{\nu+2} \nu+2 J_f \} \quad (a)$$

$$[j^2(\nu J_f) j^2(J_2) J] \{ j^{\nu+2} \nu J \} = (-1)^{J-J_f} \sqrt{\frac{2J_f+1}{2J+1}} [j^\nu(\nu J) j^2(J_2) J_f] \{ j^{\nu+2} \nu J \} \quad (b)$$

Also, in the special case of $\nu = 2$, we obviously have

$$[j^2(2, J_f) j^2(J_2) J] \{ j^4 2J \} = [j^2(2, J_2), j^2(J_f) J] \{ j^4 2J \} \quad (c)$$

No tables are given where $\nu = 3$ and $\nu_f = 1$, or $\nu = 2$ and $\nu_f = 0$, or $\nu = \nu_f = 1$ since these can be obtained directly from the ordering c.f.p. tables, e.g.,

$$[j(1, j) j^2(J_2) J] \{ j^3 \nu J \} = (-1)^{j+J_2-J} [j^2(2, J_2) j J] \{ j^3 \nu J \} .$$

¹ Amos de-Shalit and Igal Talmi, Nuclear Shell Theory (Academic Press, New York and London, 1963). See pages 529 and 530.

Clearly therefore no separate tables are needed for $j \leq 3/2$. The following tables cover all cases up to and including $j = 9/2$. If any c.f.p. appears to be omitted, it should be found either that one of the states does not exist, or that $\vec{J}_f + \vec{J} \neq \vec{J}$, or that these can be calculated using the recursion relations given above.

II. Table for Particles of Spin 5/2

		Seniority 2 to 2	
J_f	J_2	$J = 2$	$J = 4$
2	2	.3367175149	-.3912303982
4	2	*	-.3531523089
4	4	*	.6974199293

* = not calculated for reasons given in Part I.

III. Tables for Particles of Spin 7/2

A. Seniority 4 to 2

J_f	J_2	$J = 2$	$J = 4$	$J = 5$	$J = 8$
2	2	-.3350296971	-.3504667010	0.	0.
4	2	-.2332847374	-.3433858358	.3256694736	0.
4	4	.6623376623	.1966006723	0.	.3803000121
6	2	0.	.3849001795	.2905436016	-.2817180849
6	4	.3784847272	.1005037815	-.5563486403	.3668687504
6	6	-.2317736143	.5349722294	0.	-.6538014852

III. Tables for Particles of Spin 7/2 (cont.)

B. Seniority 3 to 3

J_f	J_2	$J = 3/2$	$J = 5/2$	$J = 9/2$	$J = 11/2$
3/2	2	.3240370349	.2047065263	0.	0.
3/2	4	0.	.1463850109	.2876234913	.2184657244
3/2	6	0.	0.	.2954195784	-.0838727133
5/2	2	-.2507132682	-.3752776750	.1966989481	0.
5/2	4	*	.3308620513	-.1053049768	.2094529146
5/2	6	*	*	.0259794367	-.3784847272
9/2	2	*	*	.1486470975	-.2659080117
9/2	4	*	*	.1267910465	-.0490965204
9/2	6	*	*	-.4416388277	-.2671385042
11/2	2	*	*	*	-.0317009059
11/2	4	*	*	*	-.3687526592
11/2	6	*	*	*	.1744728384

J_f	J_2	$J = 15/2$
3/2	2	0.
3/2	4	0.
3/2	6	.1463850109
5/2	2	0.
5/2	4	0.
5/2	6	-.1965613483
9/2	2	0.
9/2	4	-.3889771744
9/2	6	-.0605540069
11/2	2	.2857142857
11/2	4	-.1606404789
11/2	6	-.3653369327
15/2	2	-.2082482820
15/2	4	.3055256778
15/2	6	-.5313592545

III. Tables for Particles of Spin 7/2 (cont.)

C. Seniority 2 to 2

J_f	J_2	$J = 2$	$J = 4$	$J = 6$
2	2	.2693740119	-.2883476528	*
4	2	*	.0321047554	-.1946247360
4	4	*	.3058618482	-.4065578141
6	2	*	*	-.3178208631
6	4	*	*	.2164069221
6	6	*	*	.5446121441

IV. Tables for Particles of Spin 9/2

A. Seniority 5 to 3

J_f	J_2	$J = 1/2$	$J = 5/2$	$J = 7/2$	$J = 9/2$
3/2	2	-.2662876094	-.0550481883	.1522557657	0.
3/2	4	0.	.1295500551	.2725815461	-.3066543204
3/2	6	0.	0.	0.	.0436713147
3/2	8	0.	0.	0.	0.
5/2	2	-.3190896141	-.3000721414	-.1383264224	.1403458931
5/2	4	0.	-.0832250379	.2240024456	-.0090909091
5/2	6	0.	0.	.1530228021	-.2597943667
5/2	8	0.	0.	0.	0.
7/2	2	0.	-.3798685882	.0247644021	-.0428549564
7/2	4	-.3567530340	.2534417822	-.1056160704	.0840325532
7/2	6	0.	-.2151564397	.1095819046	-.0074417044
7/2	8	0.	0.	0.	-.0409386660
9/2	2	0.	.1797866300	-.1249425947	-.1820705319
9/2	4	-.3813850357	.0582284196	-.1418391455	-.1137304613
9/2	6	0.	.0950866110	.3409388746	-.1759102303
9/2	8	0.	0.	-.2223292378	-.3506726314
11/2	2	0.	0.	-.1756530515	.0600204811
11/2	4	0.	-.3151459979	-.1287169272	-.3100040305
11/2	6	-.3931226966	-.0594172448	-.2506402059	-.0048717391
11/2	8	0.	-.2492808376	.1581468547	.1717616906
13/2	2	0.	0.	0.	-.1377935903
13/2	4	0.	-.0612836428	.2321004199	-.0313985235
13/2	6	-.3908033684	-.3582112799	-.0092640848	.1984990831
13/2	8	0.	.3591674472	.1279449575	.0479947380
15/2	2	0.	0.	0.	0.
15/2	4	0.	0.	.2885325193	-.0121927243
15/2	6	0.	-.1190482850	.1412745225	.4669632454
15/2	8	-.3717281509	-.0409673245	.3497767357	-.1205153003
17/2	2	0.	0.	0.	0.
17/2	4	0.	0.	0.	.3064182140
17/2	6	0.	.0409673245	-.3774140725	.0073725665
17/2	8	.3302891295	-.2727738888	.0640566132	-.2467360902
21/2	2	0.	0.	0.	0.
21/2	4	0.	0.	0.	0.
21/2	6	0.	0.	0.	.1515729493
21/2	8	0.	-.2562050461	-.0832956174	.0686873257

IV. Tables for Particles of Spin 9/2 (cont.)

A. Seniority 5 to 3

J_f	J_2	$J = 11/2$	$J = 13/2$	$J = 15/2$	$J = 17/2$
3/2	2	0.	0.	0.	0.
3/2	4	-.1592656383	0.	0.	0.
3/2	6	-.0179472042	-.1689126062	-.0422281515	0.
3/2	8	0.	.2246987105	-.1896813670	.0226455407
5/2	2	0.	0.	0.	0.
5/2	4	.0283770215	.1054331853	0.	0.
5/2	6	.2323502086	-.0070835793	.2498051188	.2179449472
5/2	8	.1606679365	-.2481147699	.0351250087	-.0763762616
7/2	2	-.2067501831	0.	0.	0.
7/2	4	.2321759063	-.0389892057	-.1823553120	0.
7/2	6	-.2802348469	.0957075283	.2257441101	-.0877058019
7/2	8	.1040727001	.0280792152	-.1169967300	.4019184762
9/2	2	-.1938519616	.1138808559	0.	0.
9/2	4	.0294482269	.3171619712	.1850175742	-.0783091898
9/2	6	-.0955312897	.1698415551	-.0549518659	.0661107357
9/2	8	.1181797492	-.1679959865	-.2316417073	-.0952757104
11/2	2	-.1654650474	-.1782873956	-.1478280990	0.
11/2	4	-.1298014624	.0176991921	.2373300752	.2557258107
11/2	6	.0750785419	.2345690185	-.1246700143	.0479956120
11/2	8	.3061467860	.1735559025	.1605516272	.2265671631
13/2	2	.2284306169	-.0944250174	.0809687845	.2718251072
13/2	4	.1947021936	.2344065958	-.0851992513	-.0371573763
13/2	6	-.1782517345	.0666255966	-.1332511932	-.3546697031
13/2	8	.2979756850	-.0151645094	.3359090017	-.0845279268
15/2	2	-.2252168083	-.0484222481	-.2519973686	.1652467898
15/2	4	.0153209107	.1432025539	.0667063399	-.0023443153
15/2	6	.0462342645	-.3085702295	-.1403922928	.1661522585
15/2	8	-.1068980649	-.3171879098	.2069272286	.0149905880
17/2	2	0.	-.1292719225	.2108361251	.1107018607
17/2	4	-.2482271238	.2014487289	.0376876062	-.2565473376
17/2	6	.0138100823	-.3226838170	.2119914002	-.0062786434
17/2	8	.2182501686	-.0712861622	-.2409912133	.2419519043
21/2	2	0.	0.	0.	.2728158637
21/2	4	0.	-.2127178149	.2699086489	-.1077911315
21/2	6	.2363692986	.1955673959	.2650450316	-.0639596037
21/2	8	.2491551176	-.1082041810	-.1530238203	-.3849317530

IV. Tables for Particles of Spin 9/2 (cont.)

A. Seniority 5 to 3

J_f	J_2	$J = 19/2$	$J = 25/2$
3/2	2	0.	0.
3/2	4	0.	0.
3/2	6	0.	0.
3/2	8	.1964723864	0.
5/2	2	0.	0.
5/2	4	0.	0.
5/2	6	0.	0.
5/2	8	.2044949433	0.
7/2	2	0.	0.
7/2	4	0.	0.
7/2	6	-.0671080957	0.
7/2	8	.1457078214	0.
9/2	2	0.	0.
9/2	4	0.	0.
9/2	6	.3001165275	0.
9/2	8	.0960768923	-.1869893980
11/2	2	0.	0.
11/2	4	-.1809697637	0.
11/2	6	-.1035804911	0.
11/2	8	.2229551860	-.2356537769
13/2	2	0.	0.
13/2	4	-.1471442337	0.
13/2	6	.2167787051	-.1707825128
13/2	8	.1576453964	.2461237962
15/2	2	.1272144131	0.
15/2	4	.1569991270	0.
15/2	6	.1789998942	.3878974043
15/2	8	-.3231155303	.1114967772
17/2	2	.1855761371	0.
17/2	4	-.2067853501	.2896827298
17/2	6	-.0503382226	-.1123996879
17/2	8	-.3285659353	-.3645023881
21/2	2	-.1486783883	.1946247360
21/2	4	.2858078301	-.2172620473
21/2	6	-.36111128311	.3116555576
21/2	8	-.0932848965	-.4952173348

IV. Tables for Particles of Spin 9/2 (cont.)

B. Seniority 4 to 2

J_f	J_2	$J = 0/2$	$J = 2$	$J = 3$	$J = 4A$
2	2	-.1811857688	-.4184306096	0.	.3419845915
2	4	0.	-.2247332875	-.2461829820	.1024176298
2	6	0.	0.	0.	-.3681070910
2	8	0.	0.	0.	0.
4	2	0.	-.2247332875	.2461829820	.1024176298
4	4	.6544628930	.4734976688	0.	-.3825497948
4	6	0.	.0786173518	.5661385171	.2421888973
4	8	0.	0.	0.	.0830687758
6	2	0.	0.	0.	-.3681070910
6	4	0.	.0786173518	-.5661385171	.2421888973
6	6	-.6966731912	.3709038093	0.	.1749643080
6	8	0.	.3738333315	-.3447914136	-.0127406515
8	2	0.	0.	0.	0.
8	4	0.	0.	0.	.0830687757
8	6	0.	.3738333315	.3447914136	-.0127406515
8	8	.2312931116	-.2650885706	0.	-.5316661232

J_f	J_2	$J = 4B$	$J = 5$	$J = 6A$	$J = 6B$
2	2	.2568794570	0.	0.	0.
2	4	.3059111673	.3711348095	-.0317609561	.1624751617
2	6	-.0066755290	.1700753358	-.2525361046	.2892570729
2	8	0.	0.	-.0478797804	-.4025941393
4	2	.3059111673	-.3711348095	-.0317609561	.1624751617
4	4	.1441012051	0.	.2757769788	.3490526398
4	6	-.1089941591	-.2679456508	.2165444543	.0186175921
4	8	-.4095129914	.2370619056	.4275004305	-.1270939183
6	2	-.0066755290	-.1700753358	-.2525361046	.2892570729
6	4	-.1089941591	.2679456508	.2165444543	.0186175921
6	6	-.5611533227	0.	-.4951019492	-.1618434832
6	8	-.0380550457	-.4531446948	-.1779826222	-.2686745227
8	2	0.	0.	-.0478797804	-.4025941393
8	4	-.4095129914	-.2370619056	.4275004305	-.1270939183
8	6	-.0380550457	.4531446948	-.1779826222	-.2686745227
8	8	-.2214604231	0.	.1483840326	-.3609684735

IV. Tables for Particles of Spin 9/2 (cont.)

B. Seniority 4 to 2

J_f	J_2	$J = 7$	$J = 8$	$J = 9$	$J = 10$
2	2	0.	0.	0.	0.
2	4	0.	0.	0.	0.
2	6	.2779797246	-.2591750705	0.	0.
2	8	.3496029494	.0317820863	.1666666667	-.3408249054
4	2	0.	0.	0.	0.
4	4	0.	.4310779023	0.	0.
4	6	.1961161351	.1826902165	-.3222516933	.1793539299
4	8	-.3793934553	-.1296538197	-.3437758255	.2864459496
6	2	-.2779797246	-.2591750705	0.	0.
6	4	-.1961161351	.1826902165	.3222516933	.1793539299
6	6	0.	-.3549466779	0.	.4264014327
6	8	-.3436627971	.3381930135	.5001942125	-.1461763366
8	2	-.3496029494	.0317820863	-.1666666667	-.3408249054
8	4	.3793934553	-.1296538197	.3437758255	.2864459496
8	6	.3436627971	.3381930135	-.5001942125	-.1461763366
8	8	0.	-.4719114075	0.	-.5609681940

J_f	J_2	$J = 12$
2	2	0.
2	4	0.
2	6	0.
2	8	0.
4	2	0.
4	4	0.
4	6	0.
4	8	-.2956561980
6	2	0.
6	4	0.
6	6	.3741657387
6	8	.3765875487
8	2	0.
8	4	-.2956561980
8	6	.3765875487
8	8	-.6336706254

IV. Tables for Particles of Spin 9/2 (cont.)

C. Seniority 4 to 4

J_f	J_2	$J = 2$	$J = 3$	$J = 4A$	$J = 4B$
0	2	.1228176497	0.	0.	0.
0	4	0.	0.	-.0890226903	.1345336636
0	6	0.	0.	0.	0.
0	8	0.	0.	0.	0.
2	2	-.0453019726	-.1973855085	-.1498818210	.0903870893
2	4	-.0133820843	.1032817054	.1228691151	.1821594416
2	6	0.	0.	.1095974736	.1391265716
2	8	0.	0.	0.	0.
3	2	*	-.0615457455	.1263210229	-.0585775288
3	4	*	-.2576607566	-.1196802065	.2414716582
3	6	*	.1955751241	-.0101293784	-.0156751969
3	8	*	0.	0.	0.
4A	2	*	*	.1884657518	.1154062692
4A	4	*	*	.1063959236	-.0646228014
4A	6	*	*	.0178058850	-.2500638984
4A	8	*	*	.2142168613	.0883828797
4B	2	*	*	*	-.1201656566
4B	4	*	*	*	-.0263826971
4B	6	*	*	*	.0270215248
4B	8	*	*	*	.1531680561
5	2	*	*	*	*
5	4	*	*	*	*
5	6	*	*	*	*
5	8	*	*	*	*
6A	2	*	*	*	*
6A	4	*	*	*	*
6A	6	*	*	*	*
6A	8	*	*	*	*
6B	2	*	*	*	*
6B	4	*	*	*	*
6B	6	*	*	*	*
6B	8	*	*	*	*
7	2	*	*	*	*
7	4	*	*	*	*
7	6	*	*	*	*
7	8	*	*	*	*
8	2	*	*	*	*
8	4	*	*	*	*
8	6	*	*	*	*
8	8	*	*	*	*
9	2	*	*	*	*
9	4	*	*	*	*
9	6	*	*	*	*
9	8	*	*	*	*
10	2	*	*	*	*
10	4	*	*	*	*
10	6	*	*	*	*
10	8	*	*	*	*
12	2	*	*	*	*
12	4	*	*	*	*
12	6	*	*	*	*
12	8	*	*	*	*

IV. Tables for Particles of Spin 9/2 (cont.)

C. Seniority 4 to 4

J_f	J_2	$J = 5$	$J = 6A$	$J = 6B$	$J = 7$
0	2	0.	0.	0.	0.
0	4	0.	0.	0.	0.
0	6	0.	-.1474469741	-.0393534385	0.
0	8	0.	0.	0.	0.
2	2	0.	0.	0.	0.
2	4	.0703174971	-.1489362743	.0967482978	0.
2	6	.1841344304	.0982050295	-.1668599303	-.0075239655
2	8	0.	-.1023794790	-.1328346530	-.0679584036
3	2	-.0981930409	0.	0.	0.
3	4	-.1074854975	.0012624175	-.0493928720	.1153316259
3	6	.1078405422	-.1637403588	-.1276379532	.0106972437
3	8	-.1183437739	.2114313852	.0520170222	.0134795639
4A	2	-.0414120477	.0902724894	-.1571209468	0.
4A	4	.0039014764	-.0478496340	-.1993770256	-.1985723547
4A	6	-.1405592962	-.0194834224	-.0920067176	-.0793853531
4A	8	-.2719797393	.0888155553	.1315347719	-.1110286927
4B	2	-.0640850779	-.0385612705	-.2083505592	0.
4B	4	.1969743674	-.0093581792	-.0068692440	.0071173880
4B	6	.0105152418	-.0118222963	-.0296183527	-.1798460324
4B	8	.0516308887	-.1810167293	.0349588731	-.1910123603
5	2	.0675926369	.1810217777	.1411090666	-.1453768246
5	4	.1124809469	.1411552664	-.1616804823	-.0185545443
5	6	.1636700302	-.1524653401	.1089000237	-.2233808181
5	8	.1937262366	.1286160361	-.0417580172	-.0356635739
6A	2	*	.0033129869	.0650795211	-.1667793258
6A	4	*	-.3058689040	-.0649135720	.1421132734
6A	6	*	-.0732006250	-.0854070622	.0826023767
6A	8	*	.0858086721	.1558432916	-.0198823332
6B	2	*	*	-.1628979866	.0848049025
6B	4	*	*	.0325403181	-.0640869989
6B	6	*	*	.1851137948	.2353257729
6B	8	*	*	-.1856011764	.2210944424
7	2	*	*	*	-.1794121688
7	4	*	*	*	.2372328019
7	6	*	*	*	-.0231014942
7	8	*	*	*	.1257369714
8	2	*	*	*	*
8	4	*	*	*	*
8	6	*	*	*	*
8	8	*	*	*	*
9	2	*	*	*	*
9	4	*	*	*	*
9	6	*	*	*	*
9	8	*	*	*	*
10	2	*	*	*	*
10	4	*	*	*	*
10	6	*	*	*	*
10	8	*	*	*	*
12	2	*	*	*	*
12	4	*	*	*	*
12	6	*	*	*	*
12	8	*	*	*	*

IV. Tables for Particles of Spin 9/2 (cont.)

C. Seniority 4 to 4

J_f	J_2	$J = 8$	$J = 9$	$J = 10$	$J = 12$
0	2	0.	0.	0.	0.
0	4	0.	0.	0.	0.
0	6	0.	0.	0.	0.
0	8	-.1190482850	0.	0.	0.
2	2	0.	0.	0.	0.
2	4	0.	0.	0.	0.
2	6	.0771648622	0.	0.	0.
2	8	-.1384975060	-.1578884889	-.0922497074	0.
3	2	0.	0.	0.	0.
3	4	0.	0.	0.	0.
3	6	.1760747881	.1694637091	0.	0.
3	8	.1978909780	-.1037749043	-.0886749562	0.
4A	2	0.	0.	0.	0.
4A	4	0.	0.	0.	0.
4A	6	.1238630262	-.0159811382	.1867852982	0.
4A	8	.0300914882	.1239299539	.1423082304	.0879732702
4B	2	0.	0.	0.	0.
4B	4	.1384722028	0.	0.	0.
4B	6	-.2168768617	.1247904544	-.0182174339	0.
4B	8	.0482324425	-.2244500527	.0800113661	.0728240850
5	2	0.	0.	0.	0.
5	4	.0933891582	-.1776462367	0.	0.
5	6	.0152676204	-.1071782603	-.1315262153	0.
5	8	-.2281907227	.0233319244	-.0387849649	.1632993162
6A	2	.0666416181	0.	0.	0.
6A	4	-.0344483976	-.1196873797	-.0922344582	0.
6A	6	-.0358550290	.2721205372	.1224318793	.1443137079
6A	8	-.2663134111	.0835996246	.1240347346	-.0968318580
6B	2	-.0964376983	0.	0.	0.
6B	4	.1321555116	-.0687653553	-.1695336699	0.
6B	6	-.1472865534	-.0138527720	.0995729054	-.0508054176
6B	8	-.0270626538	.1198603690	-.2856827036	-.0984564518
7	2	-.0475170795	.1512475355	0.	0.
7	4	.0941551492	-.0892141244	.1028223424	0.
7	6	-.1446771814	-.0240453736	-.1913991322	.0714005547
7	8	.2348891794	.1549732470	.1972117645	-.1925066844
8	2	.1624070230	.1535797664	-.1142046749	0.
8	4	.0621260744	.1351308113	-.1919664088	.1981388065
8	6	.0389547030	-.0104754150	-.1040851008	.2681497832
8	8	-.1284802593	.1761792732	.0704891161	.0796246254
9	2	*	-.0148938277	-.1574202807	0.
9	4	*	-.1203738324	.1644484220	.2099455524
9	6	*	-.1811899349	.0710390306	-.2734304660
9	8	*	.3015318085	.2142880649	-.0964614578
10	2	*	*	-.0701601814	-.2147400917
10	4	*	*	-.0868231349	.1619005080
10	6	*	*	.3210618627	-.0508280170
10	8	*	*	-.0762456059	-.3330033405
12	2	*	*	*	-.1433644296
12	4	*	*	*	.1837447338
12	6	*	*	*	-.2659457826
12	8	*	*	*	.4153281363

IV. Tables for Particles of Spin 9/2 (cont.)

D. Seniority 3 to 3

J_f	J_2	$J = 3/2$	$J = 5/2$	$J = 7/2$	$J = 9/2$
3/2	2	.0738548946	-.2510583658	.0825722824	0.
3/2	4	0.	.1477097892	.0059131240	-.0806836649
3/2	6	0.	0.	0.	.2532183185
3/2	8	0.	0.	0.	0.
5/2	2	*	.0131590339	-.0750180353	.0992395327
5/2	4	*	.0474455715	-.2575426513	-.2378450082
5/2	6	*	0.	-.0663906130	-.0419891105
5/2	8	*	0.	0.	0.
7/2	2	*	*	-.3250152622	.0969696970
7/2	4	*	*	.0195420274	-.1000757696
7/2	6	*	*	.2519795191	.0127793363
7/2	8	*	*	0.	.0289480084
9/2	2	*	*	*	.1456832167
9/2	4	*	*	*	.0108391608
9/2	6	*	*	*	.0684970697
9/2	8	*	*	*	.2897707101
11/2	2	*	*	*	*
11/2	4	*	*	*	*
11/2	6	*	*	*	*
11/2	8	*	*	*	*
13/2	2	*	*	*	*
13/2	4	*	*	*	*
13/2	6	*	*	*	*
13/2	8	*	*	*	*
15/2	2	*	*	*	*
15/2	4	*	*	*	*
15/2	6	*	*	*	*
15/2	8	*	*	*	*
17/2	2	*	*	*	*
17/2	4	*	*	*	*
17/2	6	*	*	*	*
17/2	8	*	*	*	*
21/2	2	*	*	*	*
21/2	4	*	*	*	*
21/2	6	*	*	*	*
21/2	8	*	*	*	*

IV. Tables for Particles of Spin 9/2 (cont.)

D. Seniority 3 to 3

J_f	J_2	$J = 11/2$	$J = 13/2$	$J = 15/2$	$J = 17/2$
3/2	2	0.	0.	0.	0.
3/2	4	-.0509290670	0.	0.	0.
3/2	6	-.1004334746	.1648903005	.2177924848	0.
3/2	8	0.	-.0654195711	.1796850391	-.0665500145
5/2	2	0.	0.	0.	0.
5/2	4	-.1270394132	.1715375187	0.	0.
5/2	6	-.1368677550	-.0622340860	-.0415604707	.1011299794
5/2	8	-.2379986484	.0553663667	-.0858116330	-.2244521951
7/2	2	.1322268135	0.	0.	0.
7/2	4	.0704687874	-.1522430325	.0940500947	0.
7/2	6	-.2303306326	.0645643765	.0173773058	-.1546482587
7/2	8	.0976370037	.3164059225	.0190551421	.0787430391
9/2	2	-.1782180481	-.0308802827	0.	0.
9/2	4	-.0117709848	.1266583959	.2521897837	-.0302806085
9/2	6	.2012604205	-.0569404279	-.0596663748	-.2331410221
9/2	8	-.1267105080	.1606211150	.2155843230	-.1368856186
11/2	2	-.0108935398	.1972474284	-.1524852395	0.
11/2	4	.0619555688	.0089006448	.1784185620	-.0452722351
11/2	6	-.0999164479	.2949026583	.0454442605	-.1692576241
11/2	8	-.0598826928	.0963919493	-.2961761492	-.0636879502
13/2	2	*	-.0375533808	.0835196053	-.2102187413
13/2	4	*	-.2772760342	-.1137858081	.1091969480
13/2	6	*	-.0994512385	-.0051672596	.0359411156
13/2	8	*	.1025272370	.0455909733	.2484080568
15/2	2	*	*	.0136808543	.1156243225
15/2	4	*	*	.1760032123	.2135714360
15/2	6	*	*	-.0893139735	-.1627610393
15/2	8	*	*	-.0017614303	.3524310109
17/2	2	*	*	*	-.0910916171
17/2	4	*	*	*	-.0829326718
17/2	6	*	*	*	-.2029663132
17/2	8	*	*	*	.0474027182
21/2	2	*	*	*	*
21/2	4	*	*	*	*
21/2	6	*	*	*	*
21/2	8	*	*	*	*

IV. Tables for Particles of Spin 9/2 (cont.)

D. Seniority 3 to 3

J_f	J_2	$J = 21/2$
3/2	2	0.
3/2	4	0.
3/2	6	0.
3/2	8	0.
5/2	2	0.
5/2	4	0.
5/2	6	0.
5/2	8	.0953462589
7/2	2	0.
7/2	4	0.
7/2	6	0.
7/2	8	.1852359423
9/2	2	0.
9/2	4	0.
9/2	6	-.1354866907
9/2	8	-.0818634943
11/2	2	0.
11/2	4	0.
11/2	6	.2183668487
11/2	8	-.1150894346
13/2	2	0.
13/2	4	.1564465547
13/2	6	-.0684919133
13/2	8	-.2652680397
15/2	2	0.
15/2	4	.2677786108
15/2	6	.1022596461
15/2	8	.1771189026
17/2	2	.1595448070
17/2	4	.0630370794
17/2	6	-.3740406624
17/2	8	.0978743644
21/2	2	-.2208797836
21/2	4	.1962568379
21/2	6	-.0648668775
21/2	8	-.4439764791

IV. Tables for Particles of Spin 9/2 (cont.)

E. Seniority 2 to 2

J_f	J_2	$J = 2$	$J = 4$	$J = 6$	$J = 8$
2	2	.2171129824	-.2259783568	0.	0.
4	2	*	.1035045532	-.1879314160	0.
4	4	*	.0838610283	-.1614965788	-.0988960533
6	2	*	*	-.0585510172	-.1189176780
6	4	*	*	.2870125601	-.3185312766
6	6	*	*	-.1406182510	-.1105126214
8	2	*	*	*	-.2770698049
8	4	*	*	*	.0452118318
8	6	*	*	*	.3685372923
8	8	*	*	*	.3428356893

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