Surface Harmonics for the 32 Crystallographic Point Groups

Compiled and computed by Juan Lizarazo

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Here compiled are symmetry-adapted combinations of spherical harmonics that transform as irreducible representations of the crystallographic point groups. In most cases these combinations can be made to be real functions, and as such results are better expressed in terms of the sine and cosine combinations of spherical harmonics.

$$Y_{l,m}^{(c)} = \frac{1}{\sqrt{2}}\left(Y_{l,m} + Y_{l,-m}\right)(m \geq 0)$$

$$Y_{l,m}^{(s)} = \frac{1}{\sqrt{2}i}\left(Y_{l,m} - Y_{l,-m}\right)(m > 0))$$

For electronic access these functions are stored as a python dictionary `surface-harmonies_data.pkl` which only requires `sympy` for its interpretation.

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1 Group C_1

1.1 A

1.1.1 $A : l = 0$

$$Y_{0,0}^{(c)} \tag{1a}$$

1.1.2 $A : l = 1$

$$Y_{1,1}^{(c)} \tag{2a}$$

$$Y_{1,0}^{(c)} \tag{3a}$$

$$-Y_{1,1}^{(s)} \tag{4a}$$

1.1.3 $A : l = 2$

$$Y_{2,1}^{(c)} \tag{5a}$$

$$Y_{2,2}^{(c)} \tag{6a}$$

$$Y_{2,0}^{(c)} \tag{7a}$$

$$-Y_{2,1}^{(s)} \tag{8a}$$

$$-Y_{2,2}^{(s)} \tag{9a}$$

1.1.4 $A : l = 3$

$$-Y_{3,3}^{(s)} \tag{10a}$$

$$Y_{3,3}^{(c)} \tag{11a}$$

$$-Y_{3,1}^{(s)} \tag{12a}$$

$$-Y_{3,2}^{(s)} \tag{13a}$$

$$Y_{3,0}^{(c)} \tag{14a}$$

$$Y_{3,1}^{(c)} \tag{15a}$$

$$Y_{3,2}^{(c)} \tag{16a}$$

1.1.5 $A : l = 4$

$$Y_{4,0}^{(c)} \tag{17a}$$

$$-Y_{4,1}^{(s)} \tag{18a}$$

$$-Y_{4,4}^{(s)} \tag{19a}$$

$$Y_{4,4}^{(c)} \tag{20a}$$

$$Y_{4,1}^{(c)} \tag{21a}$$

$$-Y_{4,3}^{(s)} \tag{22a}$$

$$Y_{4,3}^{(c)} \tag{23a}$$

$$Y_{4,2}^{(c)} \tag{24a}$$

$$-Y_{4,2}^{(s)} \tag{25a}$$

1.1.6 $A : l = 5$

$$Y_{5,1}^{(c)} \tag{26a}$$

$$Y_{5,5}^{(c)} \tag{27a}$$

$$-Y_{5,5}^{(s)} \tag{28a}$$

$$Y_{5,0}^{(c)} \tag{29a}$$

$$-Y_{5,2}^{(s)} \tag{30a}$$

$$Y_{5,4}^{(c)} \tag{31a}$$

$$Y_{5,2}^{(c)} \tag{32a}$$

$$Y_{5,3}^{(c)} \tag{33a}$$

$$-Y_{5,3}^{(s)} \tag{34a}$$

$$-Y_{5,4}^{(s)} \tag{35a}$$

$$-Y_{5,1}^{(s)} \tag{36a}$$

1.1.7 $A : l = 6$

$$-Y_{6,4}^{(s)} \tag{37a}$$

$$-Y_{6,5}^{(s)} \tag{38a}$$

$$-Y_{6,1}^{(s)} \tag{39a}$$

$$-Y_{6,6}^{(s)} \tag{40a}$$

$$Y_{6,2}^{(c)} \tag{41a}$$

$$Y_{6,5}^{(c)} \tag{42a}$$

$$Y_{6,3}^{(c)} \tag{43a}$$

$$Y_{6,6}^{(c)} \tag{44a}$$

$$-Y_{6,2}^{(s)} \tag{45a}$$

$$-Y_{6,3}^{(s)} \tag{46a}$$

$$Y_{6,4}^{(c)} \tag{47a}$$

$$Y_{6,0}^{(c)} \tag{48a}$$

$$Y_{6,1}^{(c)} \tag{49a}$$

1.1.8 $A : l = 7$

$$Y_{7,2}^{(c)} \tag{50a}$$

$$-Y_{7,6}^{(s)} \tag{51a}$$

$$Y_{7,1}^{(c)} \tag{52a}$$

$$Y_{7,7}^{(c)} \tag{53a}$$

$$Y_{7,6}^{(c)} \tag{54a}$$

$$-Y_{7,1}^{(s)} \tag{55a}$$

$$Y_{7,5}^{(c)} \tag{56a}$$

$$-Y_{7,3}^{(s)} \tag{57a}$$

$$-Y_{7,2}^{(s)} \tag{58a}$$

$$Y_{7,3}^{(c)} \tag{59a}$$

$$-Y_{7,5}^{(s)} \tag{60a}$$

$$-Y_{7,7}^{(s)} \tag{61a}$$

$$-Y_{7,4}^{(s)} \tag{62a}$$

$$Y_{7,0}^{(c)} \tag{63a}$$

$$Y_{7,4}^{(c)} \tag{64a}$$

1.1.9 $A : l = 8$

$$Y_{8,6}^{(c)} \tag{65a}$$

$$Y_{8,8}^{(c)} \tag{66a}$$

$$-Y_{8,6}^{(s)} \tag{67a}$$

$$Y_{8,7}^{(c)} \tag{68a}$$

$$-Y_{8,3}^{(s)} \tag{69a}$$

$$Y_{8,3}^{(c)} \tag{70a}$$

$$Y_{8,2}^{(c)} \tag{71a}$$

$$Y_{8,0}^{(c)} \tag{72a}$$

$$Y_{8,4}^{(c)} \tag{73a}$$

$$-Y_{8,4}^{(s)} \tag{74a}$$

$$-Y_{8,7}^{(s)} \tag{75a}$$

$$-Y_{8,1}^{(s)} \tag{76a}$$

$$-Y_{8,5}^{(s)} \tag{77a}$$

$$-Y_{8,8}^{(s)} \tag{78a}$$

$$Y_{8,1}^{(c)} \tag{79a}$$

$$Y_{8,5}^{(c)} \tag{80a}$$

$$-Y_{8,2}^{(s)} \tag{81a}$$

1.1.10 $A : l = 9$

$$Y_{9,2}^{(c)} \tag{82a}$$

$$Y_{9,5}^{(c)} \tag{83a}$$

$$-Y_{9,5}^{(s)} \tag{84a}$$

$$Y_{9,3}^{(c)} \tag{85a}$$

$$Y_{9,1}^{(c)} \tag{86a}$$

$$Y_{9,6}^{(c)} \tag{87a}$$

$$Y_{9,8}^{(c)} \tag{88a}$$

$$Y_{9,7}^{(c)} \tag{89a}$$

$$-Y_{9,1}^{(s)} \tag{90a}$$

$$-Y_{9,2}^{(s)} \tag{91a}$$

$$-Y_{9,6}^{(s)} \tag{92a}$$

$$-Y_{9,9}^{(s)} \tag{93a}$$

$$Y_{9,0}^{(c)} \tag{94a}$$

$$Y_{9,4}^{(c)} \tag{95a}$$

$$-Y_{9,4}^{(s)} \tag{96a}$$

$$-Y_{9,8}^{(s)} \tag{97a}$$

$$-Y_{9,3}^{(s)} \tag{98a}$$

$$-Y_{9,7}^{(s)} \tag{99a}$$

$$Y_{9,9}^{(c)} \tag{100a}$$

1.1.11 $A : l = 10$

$$-Y_{10,6}^{(s)} \tag{101a}$$

$$-Y_{10,3}^{(s)} \tag{102a}$$

$$-Y_{10,9}^{(s)} \tag{103a}$$

$$Y_{10,0}^{(c)} \tag{104a}$$

$$Y_{10,6}^{(c)} \tag{105a}$$

$$Y_{10,5}^{(c)} \tag{106a}$$

$$-Y_{10,10}^{(s)} \tag{107a}$$

$$Y_{10,1}^{(c)} \tag{108a}$$

$$-Y_{10,7}^{(s)} \tag{109a}$$

$$-Y_{10,1}^{(s)} \tag{110a}$$

$$Y_{10,7}^{(c)} \tag{111a}$$

$$-Y_{10,5}^{(s)} \tag{112a}$$

$$Y_{10,8}^{(c)} \tag{113a}$$

$$Y_{10,4}^{(c)} \tag{114a}$$

$$Y_{10,3}^{(c)} \tag{115a}$$

$$Y_{10,2}^{(c)} \tag{116a}$$

$$-Y_{10,8}^{(s)} \tag{117a}$$

$$-Y_{10,4}^{(s)} \tag{118a}$$

$$Y_{10,10}^{(c)} \tag{119a}$$

$$-Y_{10,2}^{(s)} \tag{120a}$$

$$Y_{10,9}^{(c)} \tag{121a}$$

1.1.12 $A : l = 11$

$$-Y_{11,6}^{(s)} \tag{122a}$$

$$Y_{11,1}^{(c)} \tag{123a}$$

$$-Y_{11,1}^{(s)} \tag{124a}$$

$$Y_{11,2}^{(c)} \tag{125a}$$

$$-Y_{11,9}^{(s)} \tag{126a}$$

$$Y_{11,4}^{(c)} \tag{127a}$$

$$Y_{11,11}^{(c)} \tag{128a}$$

$$Y_{11,5}^{(c)} \tag{129a}$$

$$-Y_{11,8}^{(s)} \tag{130a}$$

$$Y_{11,3}^{(c)} \tag{131a}$$

$$Y_{11,6}^{(c)} \tag{132a}$$

$$Y_{11,10}^{(c)} \tag{133a}$$

$$-Y_{11,4}^{(s)} \tag{134a}$$

$$Y_{11,8}^{(c)} \tag{135a}$$

$$Y_{11,9}^{(c)} \tag{136a}$$

$$-Y_{11,5}^{(s)} \tag{137a}$$

$$-Y_{11,7}^{(s)} \tag{138a}$$

$$-Y_{11,2}^{(s)} \tag{139a}$$

$$Y_{11,7}^{(c)} \tag{140a}$$

$$-Y_{11,3}^{(s)} \tag{141a}$$

$$-Y_{11,11}^{(s)} \tag{142a}$$

$$-Y_{11,10}^{(s)} \tag{143a}$$

$$Y_{11,0}^{(c)} \tag{144a}$$

1.1.13 $A : l = 12$

$$-Y_{12,12}^{(s)} \tag{145a}$$

$$Y_{12,4}^{(c)} \tag{146a}$$

$$-Y_{12,2}^{(s)} \tag{147a}$$

$$-Y_{12,8}^{(s)} \tag{148a}$$

$$-Y_{12,9}^{(s)} \tag{149a}$$

$$Y_{12,5}^{(c)} \tag{150a}$$

$$Y_{12,9}^{(c)} \tag{151a}$$

$$Y_{12,1}^{(c)} \tag{152a}$$

$$-Y_{12,6}^{(s)} \tag{153a}$$

$$-Y_{12,5}^{(s)} \tag{154a}$$

$$-Y_{12,10}^{(s)} \tag{155a}$$

$$Y_{12,12}^{(c)} \tag{156a}$$

$$Y_{12,2}^{(c)} \tag{157a}$$

$$-Y_{12,1}^{(s)} \tag{158a}$$

$$Y_{12,11}^{(c)} \tag{159a}$$

$$Y_{12,6}^{(c)} \tag{160a}$$

$$Y_{12,8}^{(c)} \tag{161a}$$

$$Y_{12,0}^{(c)} \tag{162a}$$

$$Y_{12,10}^{(c)} \tag{163a}$$

$$-Y_{12,4}^{(s)} \tag{164a}$$

$$-Y_{12,3}^{(s)} \tag{165a}$$

$$-Y_{12,7}^{(s)} \tag{166a}$$

$$Y_{12,3}^{(c)} \tag{167a}$$

$$Y_{12,7}^{(c)} \tag{168a}$$

$$-Y_{12,11}^{(s)} \tag{169a}$$

2   Group C_i

2.1 A_g

2.1.1 $A_g : l = 0$

$$Y_{0,0}^{(c)} \tag{170a}$$

2.1.2 $A_g : l = 2$

$$Y_{2,1}^{(c)} \tag{171a}$$

$$Y_{2,2}^{(c)} \tag{172a}$$

$$Y_{2,0}^{(c)} \tag{173a}$$

$$-Y_{2,1}^{(s)} \tag{174a}$$

$$-Y_{2,2}^{(s)} \tag{175a}$$

2.1.3 $A_g : l = 4$

$$Y_{4,0}^{(c)} \tag{176a}$$

$$-Y_{4,1}^{(s)} \tag{177a}$$

$$-Y_{4,4}^{(s)} \tag{178a}$$

$$Y_{4,4}^{(c)} \tag{179a}$$

$$Y_{4,1}^{(c)} \tag{180a}$$

$$-Y_{4,3}^{(s)} \tag{181a}$$

$$Y_{4,3}^{(c)} \tag{182a}$$

$$Y_{4,2}^{(c)} \tag{183a}$$

$$-Y_{4,2}^{(s)} \tag{184a}$$

2.1.4 $A_g : l = 6$

$$-Y_{6,4}^{(s)} \tag{185a}$$

$$-Y_{6,5}^{(s)} \tag{186a}$$

$$-Y_{6,1}^{(s)} \tag{187a}$$

$$-Y_{6,6}^{(s)} \tag{188a}$$

$$Y_{6,2}^{(c)} \tag{189a}$$

$$Y_{6,5}^{(c)} \tag{190a}$$

$$Y_{6,3}^{(c)} \tag{191a}$$

$$Y_{6,6}^{(c)} \tag{192a}$$

$$-Y_{6,2}^{(s)} \tag{193a}$$

$$-Y_{6,3}^{(s)} \tag{194a}$$

$$Y_{6,4}^{(c)} \tag{195a}$$

$$Y_{6,0}^{(c)} \tag{196a}$$

$$Y_{6,1}^{(c)} \tag{197a}$$

2.1.5 $A_g : l = 8$

$$Y_{8,6}^{(c)} \tag{198a}$$

$$Y_{8,8}^{(c)} \tag{199a}$$

$$-Y_{8,6}^{(s)} \tag{200a}$$

$$Y_{8,7}^{(c)} \tag{201a}$$

$$-Y_{8,3}^{(s)} \tag{202a}$$

$$Y_{8,3}^{(c)} \tag{203a}$$

$$Y_{8,2}^{(c)} \tag{204a}$$

$$Y_{8,0}^{(c)} \tag{205a}$$

$$Y_{8,4}^{(c)} \tag{206a}$$

$$-Y_{8,4}^{(s)} \tag{207a}$$

$$-Y_{8,7}^{(s)} \tag{208a}$$

$$-Y_{8,1}^{(s)} \tag{209a}$$

$$-Y_{8,5}^{(s)} \tag{210a}$$

$$-Y_{8,8}^{(s)} \tag{211a}$$

$$Y_{8,1}^{(c)} \tag{212a}$$

$$Y_{8,5}^{(c)} \tag{213a}$$

$$-Y_{8,2}^{(s)} \tag{214a}$$

2.1.6 $A_g : l = 10$

$$-Y_{10,6}^{(s)} \tag{215a}$$

$$-Y_{10,3}^{(s)} \tag{216a}$$

$$-Y_{10,9}^{(s)} \tag{217a}$$

$$Y_{10,0}^{(c)} \tag{218a}$$

$$Y_{10,6}^{(c)} \tag{219a}$$

$$Y_{10,5}^{(c)} \tag{220a}$$

$$-Y_{10,10}^{(s)} \tag{221a}$$

$$Y_{10,1}^{(c)} \tag{222a}$$

$$-Y_{10,7}^{(s)} \tag{223a}$$

$$-Y_{10,1}^{(s)} \tag{224a}$$

$$Y_{10,7}^{(c)} \tag{225a}$$

$$-Y_{10,5}^{(s)} \tag{226a}$$

$$Y_{10,8}^{(c)} \tag{227a}$$

$$Y_{10,4}^{(c)} \tag{228a}$$

$$Y_{10,3}^{(c)} \tag{229a}$$

$$Y_{10,2}^{(c)} \tag{230a}$$

$$-Y_{10,8}^{(s)} \tag{231a}$$

$$-Y_{10,4}^{(s)} \tag{232a}$$

$$Y_{10,10}^{(c)} \tag{233a}$$

$$-Y_{10,2}^{(s)} \tag{234a}$$

$$Y_{10,9}^{(c)} \tag{235a}$$

2.1.7 $A_g : l = 12$

$$-Y_{12,12}^{(c)} \tag{236a}$$

$$Y_{12,4}^{(c)} \tag{237a}$$

$$-Y_{12,2}^{(s)} \tag{238a}$$

$$-Y_{12,8}^{(s)} \tag{239a}$$

$$-Y_{12,9}^{(s)} \tag{240a}$$

$$Y_{12,5}^{(c)} \tag{241a}$$

$$Y_{12,9}^{(c)} \tag{242a}$$

$$Y_{12,1}^{(c)} \tag{243a}$$

$$-Y_{12,6}^{(s)} \tag{244a}$$

$$-Y_{12,5}^{(s)} \tag{245a}$$

$$-Y_{12,10}^{(s)} \tag{246a}$$

$$Y_{12,12}^{(c)} \tag{247a}$$

$$Y_{12,2}^{(c)} \tag{248a}$$

$$-Y_{12,1}^{(s)} \tag{249a}$$

$$Y_{12,11}^{(c)} \tag{250a}$$

$$Y_{12,6}^{(c)} \tag{251a}$$

$$Y_{12,8}^{(c)} \tag{252a}$$

$$Y_{12,0}^{(c)} \tag{253a}$$

$$Y_{12,10}^{(c)} \tag{254a}$$

$$-Y_{12,4}^{(s)} \tag{255a}$$

$$-Y_{12,3}^{(s)} \tag{256a}$$

$$-Y_{12,7}^{(s)} \tag{257a}$$

$$Y_{12,3}^{(c)} \tag{258a}$$

$$Y_{12,7}^{(c)} \tag{259a}$$

$$-Y_{12,11}^{(s)} \tag{260a}$$

2.2 A_u

2.2.1 $A_u : l = 1$

$$Y_{1,1}^{(c)} \tag{261a}$$

$$Y_{1,0}^{(c)} \tag{262a}$$

$$-Y_{1,1}^{(s)} \tag{263a}$$

2.2.2 $A_u : l = 3$

$$-Y_{3,3}^{(s)} \tag{264a}$$

$$Y_{3,3}^{(c)} \tag{265a}$$

$$-Y_{3,1}^{(s)} \tag{266a}$$

$$-Y_{3,2}^{(s)} \tag{267a}$$

$$Y_{3,0}^{(c)} \tag{268a}$$

$$Y_{3,1}^{(c)} \tag{269a}$$

$$Y_{3,2}^{(c)} \tag{270a}$$

2.2.3 $A_u : l = 5$

$Y_{5,1}^{(c)}$ (271a)

$Y_{5,5}^{(c)}$ (272a)

$-Y_{5,5}^{(s)}$ (273a)

$Y_{5,0}^{(c)}$ (274a)

$-Y_{5,2}^{(s)}$ (275a)

$Y_{5,4}^{(c)}$ (276a)

$Y_{5,2}^{(c)}$ (277a)

$Y_{5,3}^{(c)}$ (278a)

$-Y_{5,3}^{(s)}$ (279a)

$-Y_{5,4}^{(s)}$ (280a)

$-Y_{5,1}^{(s)}$ (281a)

2.2.4 $A_u : l = 7$

$Y_{7,2}^{(c)}$ (282a)

$-Y_{7,6}^{(s)}$ (283a)

$Y_{7,1}^{(c)}$ (284a)

$Y_{7,7}^{(c)}$ (285a)

$Y_{7,6}^{(c)}$ (286a)

$-Y_{7,1}^{(s)}$ (287a)

$Y_{7,5}^{(c)}$ (288a)

$-Y_{7,3}^{(s)}$ (289a)

$-Y_{7,2}^{(s)}$ (290a)

$Y_{7,3}^{(c)}$ (291a)

$-Y_{7,5}^{(s)}$ (292a)

$-Y_{7,7}^{(s)}$ (293a)

$-Y_{7,4}^{(s)}$ (294a)

$Y_{7,0}^{(c)}$ (295a)

$Y_{7,4}^{(c)}$ (296a)

2.2.5 $A_u : l = 9$

$Y_{9,2}^{(c)}$ (297a)

$Y_{9,5}^{(c)}$ (298a)

$-Y_{9,5}^{(s)}$ (299a)

$Y_{9,3}^{(c)}$ (300a)

$Y_{9,1}^{(c)}$ (301a)

$Y_{9,6}^{(c)}$ (302a)

$Y_{9,8}^{(c)}$ (303a)

$Y_{9,7}^{(c)}$ (304a)

$-Y_{9,1}^{(s)}$ (305a)

$-Y_{9,2}^{(s)}$ (306a)

$-Y_{9,6}^{(s)}$ (307a)

$-Y_{9,9}^{(s)}$ (308a)

$Y_{9,0}^{(c)}$ (309a)

$Y_{9,4}^{(c)}$ (310a)

$-Y_{9,4}^{(s)}$ (311a)

$-Y_{9,8}^{(s)}$ (312a)

$-Y_{9,3}^{(s)}$ (313a)

$-Y_{9,7}^{(s)}$ (314a)

$Y_{9,9}^{(c)}$ (315a)

2.2.6 $A_u : l = 11$

$-Y_{11,6}^{(s)}$ (316a)

$Y_{11,1}^{(c)}$ (317a)

$-Y_{11,1}^{(s)}$ (318a)

$Y_{11,2}^{(c)}$ (319a)

$-Y_{11,9}^{(s)}$ (320a)

$Y_{11,4}^{(c)}$ (321a)

$Y_{11,11}^{(c)}$ (322a)

$Y_{11,5}^{(c)}$ (323a)

$-Y_{11,8}^{(s)}$ (324a)

$Y_{11,3}^{(c)}$ (325a)

$Y_{11,6}^{(c)}$ (326a)

$Y_{11,10}^{(c)}$ (327a)

$-Y_{11,4}^{(s)}$ (328a)

$Y_{11,8}^{(c)}$ (329a)

$Y_{11,9}^{(c)}$ (330a)

$-Y_{11,5}^{(s)}$ (331a)

$-Y_{11,7}^{(s)}$ (332a)

$-Y_{11,2}^{(s)}$ (333a)

$Y_{11,7}^{(c)}$ (334a)

$-Y_{11,3}^{(s)}$ (335a)

$-Y_{11,11}^{(s)}$ (336a)

$-Y_{11,10}^{(s)}$ (337a)

$Y_{11,0}^{(c)}$ (338a)

3   Group C_2

3.1 A

3.1.1 $A : l = 0$

$Y_{0,0}^{(c)}$ (339a)

3.1.2 $A : l = 1$

$Y_{1,0}^{(c)}$ (340a)

3.1.3 $A : l = 2$

$Y_{2,2}^{(c)}$ (341a)

$Y_{2,0}^{(c)}$ (342a)

$-Y_{2,2}^{(s)}$ (343a)

3.1.4 $A : l = 3$

$-Y_{3,2}^{(s)}$ (344a)

$Y_{3,0}^{(c)}$ (345a)

$Y_{3,2}^{(c)}$ (346a)

3.1.5 $A : l = 4$

$Y_{4,0}^{(c)}$ (347a)

$-Y_{4,4}^{(s)}$ (348a)

$Y_{4,4}^{(c)}$ (349a)

$Y_{4,2}^{(c)}$ (350a)

$-Y_{4,2}^{(s)}$ (351a)

3.1.6 $A : l = 5$

$Y_{5,0}^{(c)}$ (352a)

$-Y_{5,2}^{(s)}$ (353a)

$Y_{5,4}^{(c)}$ (354a)

$Y_{5,2}^{(c)}$ (355a)

$-Y_{5,4}^{(s)}$ (356a)

3.1.7 $A : l = 6$

$-Y_{6,4}^{(s)}$ (357a)

$-Y_{6,6}^{(s)}$ (358a)

$Y_{6,2}^{(c)}$ (359a)

$Y_{6,6}^{(c)}$ (360a)

$-Y_{6,2}^{(s)}$ (361a)

$Y_{6,4}^{(c)}$ (362a)

$Y_{6,0}^{(c)}$ (363a)

3.1.8 $A : l = 7$

$Y_{7,2}^{(c)}$ (364a)

$-Y_{7,6}^{(s)}$ (365a)

$Y_{7,6}^{(c)}$ (366a)

$-Y_{7,2}^{(s)}$ (367a)

$-Y_{7,4}^{(s)}$ (368a)

$Y_{7,0}^{(c)}$ (369a)

$Y_{7,4}^{(c)}$ (370a)

3.1.9 $A : l = 8$

$Y_{8,6}^{(c)}$ (371a)

$Y_{8,8}^{(c)}$ (372a)

$-Y_{8,6}^{(s)}$ (373a)

$Y_{8,2}^{(c)}$ (374a)

$Y_{8,0}^{(c)}$ (375a)

$Y_{8,4}^{(c)}$ (376a)

$-Y_{8,8}^{(s)}$ (377a)

$-Y_{8,4}^{(s)}$ (378a)

$-Y_{8,2}^{(s)}$ (379a)

3.1.10 $A : l = 9$

$-Y_{9,2}^{(s)}$ (380a)

$Y_{9,8}^{(c)}$ (381a)

$Y_{9,2}^{(c)}$ (382a)

$-Y_{9,6}^{(s)}$ (383a)

$Y_{9,0}^{(c)}$ (384a)

$Y_{9,4}^{(c)}$ (385a)

$-Y_{9,4}^{(s)}$ (386a)

$-Y_{9,8}^{(s)}$ (387a)

$Y_{9,6}^{(c)}$ (388a)

3.1.11 $A : l = 10$

$Y_{10,2}^{(c)}$ (389a)

$-Y_{10,8}^{(s)}$ (390a)

$-Y_{10,4}^{(s)}$ (391a)

$-Y_{10,2}^{(s)}$ (392a)

$-Y_{10,6}^{(s)}$ (393a)

$-Y_{10,10}^{(s)}$ (394a)

$Y_{10,0}^{(c)}$ (395a)

$Y_{10,6}^{(c)}$ (396a)

$Y_{10,8}^{(c)}$ (397a)

$Y_{10,4}^{(c)}$ (398a)

$Y_{10,10}^{(c)}$ (399a)

3.1.12 $A : l = 11$

$-Y_{11,4}^{(s)}$ (400a)

$-Y_{11,6}^{(s)}$ (401a)

$-Y_{11,8}^{(s)}$ (402a)

$Y_{11,6}^{(c)}$ (403a)

$-Y_{11,10}^{(s)}$ (404a)

$Y_{11,2}^{(c)}$ (405a)

$Y_{11,10}^{(c)}$ (406a)

$Y_{11,0}^{(c)}$ (407a)

$Y_{11,8}^{(c)}$ (408a)

$Y_{11,4}^{(c)}$ (409a)

$-Y_{11,2}^{(s)}$ (410a)

3.1.13 $A : l = 12$

$Y_{12,10}^{(c)}$ (411a)

$Y_{12,6}^{(c)}$ (412a)

$-Y_{12,4}^{(s)}$ (413a)

$Y_{12,4}^{(c)}$ (414a)

$-Y_{12,12}^{(s)}$ (415a)

$-Y_{12,2}^{(s)}$ (416a)

$-Y_{12,6}^{(s)}$ (417a)

$Y_{12,8}^{(c)}$ (418a)

$-Y_{12,8}^{(s)}$ (419a)

$Y_{12,0}^{(c)}$ (420a)

$-Y_{12,10}^{(s)}$ (421a)

$Y_{12,12}^{(c)}$ (422a)

$Y_{12,2}^{(c)}$ (423a)

3.2 B

3.2.1 $B : l = 1$

$Y_{1,1}^{(c)}$ (424a)

$-Y_{1,1}^{(s)}$ (425a)

3.2.2 $B : l = 2$

$-Y_{2,1}^{(s)}$ (426a)

$Y_{2,1}^{(c)}$ (427a)

3.2.3 $B : l = 3$

$Y_{3,3}^{(c)}$ (428a)

$-Y_{3,3}^{(s)}$ (429a)

$Y_{3,1}^{(c)}$ (430a)

$-Y_{3,1}^{(s)}$ (431a)

3.2.4 $B : l = 4$

$-Y_{4,1}^{(s)}$ (432a)

$Y_{4,3}^{(c)}$ (433a)

$Y_{4,1}^{(c)}$ (434a)

$-Y_{4,3}^{(s)}$ (435a)

3.2.5 $B : l = 5$

$Y_{5,1}^{(c)}$ (436a)

$Y_{5,5}^{(c)}$ (437a)

$-Y_{5,5}^{(s)}$ (438a)

$Y_{5,3}^{(c)}$ (439a)

$-Y_{5,3}^{(s)}$ (440a)

$-Y_{5,1}^{(s)}$ (441a)

3.2.6 $B : l = 6$

$-Y_{6,5}^{(s)}$ (442a)

$-Y_{6,1}^{(s)}$ (443a)

$Y_{6,5}^{(c)}$ (444a)

$-Y_{6,3}^{(s)}$ (445a)

$Y_{6,3}^{(c)}$ (446a)

$Y_{6,1}^{(c)}$ (447a)

3.2.7 $B : l = 7$

$Y_{7,1}^{(c)}$ (448a)

$-Y_{7,1}^{(s)}$ (449a)

$Y_{7,5}^{(c)}$ (450a)

$-Y_{7,3}^{(s)}$ (451a)

$Y_{7,3}^{(c)}$ (452a)

$-Y_{7,7}^{(s)}$ (453a)

$-Y_{7,5}^{(s)}$ (454a)

$Y_{7,7}^{(c)}$ (455a)

3.2.8 $B : l = 8$

$Y_{8,7}^{(c)}$ (456a)

$Y_{8,1}^{(c)}$ (457a)

$Y_{8,3}^{(c)}$ (458a)

$-Y_{8,3}^{(s)}$ (459a)

$-Y_{8,7}^{(s)}$ (460a)

$-Y_{8,5}^{(s)}$ (461a)

$-Y_{8,1}^{(s)}$ (462a)

$Y_{8,5}^{(c)}$ (463a)

3.2.9 $B : l = 9$

$-Y_{9,9}^{(s)}$ (464a)

$-Y_{9,7}^{(s)}$ (465a)

$Y_{9,7}^{(c)}$ (466a)

$-Y_{9,1}^{(s)}$ (467a)

$-Y_{9,3}^{(s)}$ (468a)

$Y_{9,1}^{(c)}$ (469a)

$Y_{9,5}^{(c)}$ (470a)

$-Y_{9,5}^{(s)}$ (471a)

$Y_{9,9}^{(c)}$ (472a)

$Y_{9,3}^{(c)}$ (473a)

3.2.10 $B : l = 10$

$Y_{10,1}^{(c)}$ (474a)

$-Y_{10,3}^{(s)}$ (475a)

$-Y_{10,7}^{(s)}$ (476a)

$Y_{10,3}^{(c)}$ (477a)

$-Y_{10,1}^{(s)}$ (478a)

$-Y_{10,9}^{(s)}$ (479a)

$Y_{10,7}^{(c)}$ (480a)

$-Y_{10,5}^{(s)}$ (481a)

$Y_{10,5}^{(c)}$ (482a)

$Y_{10,9}^{(c)}$ (483a)

3.2.11 $B : l = 11$

$Y_{11,11}^{(c)}$ (484a)

$Y_{11,5}^{(c)}$ (485a)

$Y_{11,1}^{(c)}$ (486a)

$-Y_{11,3}^{(s)}$ (487a)

$-Y_{11,11}^{(s)}$ (488a)

$Y_{11,3}^{(c)}$ (489a)

$-Y_{11,1}^{(s)}$ (490a)

$Y_{11,9}^{(c)}$ (491a)

$-Y_{11,9}^{(s)}$ (492a)

$-Y_{11,5}^{(s)}$ (493a)

$-Y_{11,7}^{(s)}$ (494a)

$Y_{11,7}^{(c)}$ (495a)

3.2.12 $B : l = 12$

$Y_{12,9}^{(c)}$ (496a)

$Y_{12,1}^{(c)}$ (497a)

$-Y_{12,3}^{(s)}$ (498a)

$-Y_{12,5}^{(s)}$ (499a)

$-Y_{12,7}^{(s)}$ (500a)

$-Y_{12,11}^{(s)}$ (501a)

$Y_{12,7}^{(c)}$ (502a)

$Y_{12,3}^{(c)}$ (503a)

$-Y_{12,9}^{(s)}$ (504a)

$Y_{12,5}^{(c)}$ (505a)

$-Y_{12,1}^{(s)}$ (506a)

$Y_{12,11}^{(c)}$ (507a)

4   Group C_S

4.1 A'

4.1.1 $A' : l = 0$

$$Y_{0,0}^{(c)} \tag{508a}$$

4.1.2 $A' : l = 1$

$$Y_{1,1}^{(c)} \tag{509a}$$

$$-Y_{1,1}^{(s)} \tag{510a}$$

4.1.3 $A' : l = 2$

$$Y_{2,2}^{(c)} \tag{511a}$$

$$Y_{2,0}^{(c)} \tag{512a}$$

$$-Y_{2,2}^{(s)} \tag{513a}$$

4.1.4 $A' : l = 3$

$$Y_{3,3}^{(c)} \tag{514a}$$

$$-Y_{3,3}^{(s)} \tag{515a}$$

$$Y_{3,1}^{(c)} \tag{516a}$$

$$-Y_{3,1}^{(s)} \tag{517a}$$

4.1.5 $A' : l = 4$

$$Y_{4,0}^{(c)} \tag{518a}$$

$$-Y_{4,4}^{(s)} \tag{519a}$$

$$Y_{4,4}^{(c)} \tag{520a}$$

$$Y_{4,2}^{(c)} \tag{521a}$$

$$-Y_{4,2}^{(s)} \tag{522a}$$

4.1.6 $A' : l = 5$

$$Y_{5,1}^{(c)} \tag{523a}$$

$$Y_{5,5}^{(c)} \tag{524a}$$

$$-Y_{5,5}^{(s)} \tag{525a}$$

$$Y_{5,3}^{(c)} \tag{526a}$$

$$-Y_{5,3}^{(s)} \tag{527a}$$

$$-Y_{5,1}^{(s)} \tag{528a}$$

4.1.7 $A' : l = 6$

$$-Y_{6,4}^{(s)} \tag{529a}$$

$$-Y_{6,6}^{(s)} \tag{530a}$$

$$Y_{6,2}^{(c)} \tag{531a}$$

$$Y_{6,6}^{(c)} \tag{532a}$$

$$-Y_{6,2}^{(s)} \tag{533a}$$

$$Y_{6,4}^{(c)} \tag{534a}$$

$$Y_{6,0}^{(c)} \tag{535a}$$

4.1.8 $A' : l = 7$

$$Y_{7,1}^{(c)} \tag{536a}$$

$$-Y_{7,1}^{(s)} \tag{537a}$$

$$Y_{7,5}^{(c)} \tag{538a}$$

$$-Y_{7,3}^{(s)} \tag{539a}$$

$$Y_{7,3}^{(c)} \tag{540a}$$

$$-Y_{7,7}^{(s)} \tag{541a}$$

$$-Y_{7,5}^{(s)} \tag{542a}$$

$$Y_{7,7}^{(c)} \tag{543a}$$

4.1.9 $A' : l = 8$

$$Y_{8,6}^{(c)} \tag{544a}$$

$$Y_{8,8}^{(c)} \tag{545a}$$

$$-Y_{8,6}^{(s)} \tag{546a}$$

$$Y_{8,2}^{(c)} \tag{547a}$$

$$Y_{8,0}^{(c)} \tag{548a}$$

$$Y_{8,4}^{(c)} \tag{549a}$$

$$-Y_{8,8}^{(s)} \tag{550a}$$

$$-Y_{8,4}^{(s)} \tag{551a}$$

$$-Y_{8,2}^{(s)} \tag{552a}$$

4.1.10 $A' : l = 9$

$$-Y_{9,9}^{(s)} \tag{553a}$$

$$-Y_{9,7}^{(s)} \tag{554a}$$

$$Y_{9,7}^{(c)} \tag{555a}$$

$$-Y_{9,1}^{(s)} \tag{556a}$$

$$-Y_{9,3}^{(s)} \tag{557a}$$

$$Y_{9,1}^{(c)} \tag{558a}$$

$$Y_{9,5}^{(c)} \tag{559a}$$

$$-Y_{9,5}^{(s)} \tag{560a}$$

$$Y_{9,9}^{(c)} \tag{561a}$$

$$Y_{9,3}^{(c)} \tag{562a}$$

4.1.11 $A' : l = 10$

$$Y_{10,2}^{(c)} \tag{563a}$$

$$-Y_{10,8}^{(s)} \tag{564a}$$

$$-Y_{10,4}^{(s)} \tag{565a}$$

$$-Y_{10,2}^{(s)} \tag{566a}$$

$$-Y_{10,6}^{(s)} \tag{567a}$$

$$-Y_{10,10}^{(s)} \tag{568a}$$

$$Y_{10,0}^{(c)} \tag{569a}$$

$$Y_{10,6}^{(c)} \tag{570a}$$

$$Y_{10,8}^{(c)} \tag{571a}$$

$$Y_{10,4}^{(c)} \tag{572a}$$

$$Y_{10,10}^{(c)} \tag{573a}$$

4.1.12 $A' : l = 11$

$$Y_{11,11}^{(c)} \tag{574a}$$

$$Y_{11,5}^{(c)} \tag{575a}$$

$$Y_{11,1}^{(c)} \tag{576a}$$

$$-Y_{11,3}^{(s)} \tag{577a}$$

$$-Y_{11,11}^{(s)} \tag{578a}$$

$$Y_{11,3}^{(c)} \tag{579a}$$

$$-Y_{11,1}^{(s)} \tag{580a}$$

$$Y_{11,9}^{(c)} \tag{581a}$$

$$-Y_{11,9}^{(s)} \tag{582a}$$

$$-Y_{11,5}^{(s)} \tag{583a}$$

$$-Y_{11,7}^{(s)} \tag{584a}$$

$$Y_{11,7}^{(c)} \tag{585a}$$

4.1.13 $A' : l = 12$

$$Y_{12,10}^{(c)} \tag{586a}$$

$$Y_{12,6}^{(c)} \tag{587a}$$

$$-Y_{12,4}^{(s)} \tag{588a}$$

$$Y_{12,4}^{(c)} \tag{589a}$$

$$-Y_{12,12}^{(s)} \tag{590a}$$

$$-Y_{12,2}^{(s)} \tag{591a}$$

$$-Y_{12,6}^{(s)} \tag{592a}$$

$$Y_{12,8}^{(c)} \tag{593a}$$

$$-Y_{12,8}^{(s)} \tag{594a}$$

$$Y_{12,0}^{(c)} \tag{595a}$$

$$-Y_{12,10}^{(s)} \tag{596a}$$

$$Y_{12,12}^{(c)} \tag{597a}$$

$$Y_{12,2}^{(c)} \tag{598a}$$

4.2 A''

4.2.1 $A'' : l = 1$

$$Y_{1,0}^{(c)} \tag{599a}$$

4.2.2 $A'' : l = 2$

$$-Y_{2,1}^{(s)} \tag{600a}$$

$$Y_{2,1}^{(c)} \tag{601a}$$

4.2.3 $A'' : l = 3$

$$-Y_{3,2}^{(s)} \tag{602a}$$

$$Y_{3,0}^{(c)} \tag{603a}$$

$$Y_{3,2}^{(c)} \tag{604a}$$

4.2.4 $A'' : l = 4$

$$-Y_{4,1}^{(s)} \tag{605a}$$

$$Y_{4,3}^{(c)} \tag{606a}$$

$$Y_{4,1}^{(c)} \tag{607a}$$

$$-Y_{4,3}^{(s)} \tag{608a}$$

4.2.5 $A'' : l = 5$

$Y_{5,0}^{(c)}$	(609a)

$-Y_{5,2}^{(s)}$	(610a)

$Y_{5,4}^{(c)}$	(611a)

$Y_{5,2}^{(c)}$	(612a)

$-Y_{5,4}^{(s)}$	(613a)

4.2.6 $A'' : l = 6$

$-Y_{6,5}^{(s)}$	(614a)

$-Y_{6,1}^{(s)}$	(615a)

$Y_{6,5}^{(c)}$	(616a)

$-Y_{6,3}^{(s)}$	(617a)

$Y_{6,3}^{(c)}$	(618a)

$Y_{6,1}^{(c)}$	(619a)

4.2.7 $A'' : l = 7$

$Y_{7,2}^{(c)}$	(620a)

$-Y_{7,6}^{(s)}$	(621a)

$Y_{7,6}^{(c)}$	(622a)

$-Y_{7,2}^{(s)}$	(623a)

$-Y_{7,4}^{(s)}$	(624a)

$Y_{7,0}^{(c)}$	(625a)

$Y_{7,4}^{(c)}$	(626a)

4.2.8 $A'' : l = 8$

$Y_{8,7}^{(c)}$	(627a)

$Y_{8,1}^{(c)}$	(628a)

$Y_{8,3}^{(c)}$	(629a)

$-Y_{8,3}^{(s)}$	(630a)

$-Y_{8,7}^{(s)}$	(631a)

$-Y_{8,5}^{(s)}$	(632a)

$-Y_{8,1}^{(s)}$	(633a)

$Y_{8,5}^{(c)}$	(634a)

4.2.9 $A'' : l = 9$

$-Y_{9,2}^{(s)}$	(635a)

$Y_{9,8}^{(c)}$	(636a)

$Y_{9,2}^{(c)}$	(637a)

$-Y_{9,6}^{(s)}$	(638a)

$Y_{9,0}^{(c)}$	(639a)

$Y_{9,4}^{(c)}$	(640a)

$-Y_{9,4}^{(s)}$	(641a)

$-Y_{9,8}^{(s)}$	(642a)

$Y_{9,6}^{(c)}$	(643a)

4.2.10 $A'' : l = 10$

$Y_{10,1}^{(c)}$	(644a)

$-Y_{10,3}^{(s)}$	(645a)

$-Y_{10,7}^{(s)}$	(646a)

$Y_{10,3}^{(c)}$	(647a)

$-Y_{10,1}^{(s)}$	(648a)

$-Y_{10,9}^{(s)}$	(649a)

$Y_{10,7}^{(c)}$	(650a)

$-Y_{10,5}^{(s)}$	(651a)

$Y_{10,5}^{(c)}$	(652a)

$Y_{10,9}^{(c)}$	(653a)

4.2.11 $A'' : l = 11$

$-Y_{11,4}^{(s)}$	(654a)

$-Y_{11,6}^{(s)}$	(655a)

$-Y_{11,8}^{(s)}$	(656a)

$Y_{11,6}^{(c)}$	(657a)

$-Y_{11,10}^{(s)}$	(658a)

$Y_{11,2}^{(c)}$	(659a)

$Y_{11,10}^{(c)}$	(660a)

$Y_{11,0}^{(c)}$	(661a)

$Y_{11,8}^{(c)}$	(662a)

$Y_{11,4}^{(c)}$	(663a)

$-Y_{11,2}^{(s)}$	(664a)

4.2.12 $A'' : l = 12$

$Y_{12,9}^{(c)}$	(665a)

$Y_{12,1}^{(c)}$	(666a)

$-Y_{12,3}^{(s)}$	(667a)

$-Y_{12,5}^{(s)}$	(668a)

$-Y_{12,7}^{(s)}$	(669a)

$-Y_{12,11}^{(s)}$	(670a)

$Y_{12,7}^{(c)}$	(671a)

$Y_{12,3}^{(c)}$	(672a)

$-Y_{12,9}^{(s)}$	(673a)

$Y_{12,5}^{(c)}$	(674a)

$-Y_{12,1}^{(s)}$	(675a)

$Y_{12,11}^{(c)}$	(676a)

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5 Group C_{2h}

5.1 A_g

5.1.1 $A_g : l = 0$

$Y_{0,0}^{(c)}$ (677a)

5.1.2 $A_g : l = 2$

$Y_{2,2}^{(c)}$ (678a)

$Y_{2,0}^{(c)}$ (679a)

$-Y_{2,2}^{(s)}$ (680a)

5.1.3 $A_g : l = 4$

$Y_{4,0}^{(c)}$ (681a)

$-Y_{4,4}^{(s)}$ (682a)

$Y_{4,4}^{(c)}$ (683a)

$Y_{4,2}^{(c)}$ (684a)

$-Y_{4,2}^{(s)}$ (685a)

5.1.4 $A_g : l = 6$

$-Y_{6,4}^{(s)}$ (686a)

$-Y_{6,6}^{(s)}$ (687a)

$Y_{6,2}^{(c)}$ (688a)

$Y_{6,6}^{(c)}$ (689a)

$-Y_{6,2}^{(s)}$ (690a)

$Y_{6,4}^{(c)}$ (691a)

$Y_{6,0}^{(c)}$ (692a)

5.1.5 $A_g : l = 8$

$Y_{8,6}^{(c)}$ (693a)

$Y_{8,8}^{(c)}$ (694a)

$-Y_{8,6}^{(s)}$ (695a)

$Y_{8,2}^{(c)}$ (696a)

$Y_{8,0}^{(c)}$ (697a)

$Y_{8,4}^{(c)}$ (698a)

$-Y_{8,8}^{(s)}$ (699a)

$-Y_{8,4}^{(s)}$ (700a)

$-Y_{8,2}^{(s)}$ (701a)

5.1.6 $A_g : l = 10$

$Y_{10,2}^{(c)}$ (702a)

$-Y_{10,8}^{(s)}$ (703a)

$-Y_{10,4}^{(s)}$ (704a)

$-Y_{10,2}^{(s)}$ (705a)

$-Y_{10,6}^{(s)}$ (706a)

$-Y_{10,10}^{(s)}$ (707a)

$Y_{10,0}^{(c)}$ (708a)

$Y_{10,6}^{(c)}$ (709a)

$Y_{10,8}^{(c)}$ (710a)

$Y_{10,4}^{(c)}$ (711a)

$Y_{10,10}^{(c)}$ (712a)

5.1.7 $A_g : l = 12$

$Y_{12,10}^{(c)}$ (713a)

$Y_{12,6}^{(c)}$ (714a)

$-Y_{12,4}^{(s)}$ (715a)

$Y_{12,4}^{(c)}$ (716a)

$-Y_{12,12}^{(s)}$ (717a)

$-Y_{12,2}^{(s)}$ (718a)

$-Y_{12,6}^{(s)}$ (719a)

$Y_{12,8}^{(c)}$ (720a)

$-Y_{12,8}^{(s)}$ (721a)

$Y_{12,0}^{(c)}$ (722a)

$-Y_{12,10}^{(s)}$ (723a)

$Y_{12,12}^{(c)}$ (724a)

$Y_{12,2}^{(c)}$ (725a)

5.2 B_u

5.2.1 $B_u : l = 1$

$Y_{1,1}^{(c)}$ (726a)

$-Y_{1,1}^{(s)}$ (727a)

5.2.2 $B_u : l = 3$

$Y_{3,3}^{(c)}$ (728a)

$-Y_{3,3}^{(s)}$ (729a)

$Y_{3,1}^{(c)}$ (730a)

$-Y_{3,1}^{(s)}$ (731a)

5.2.3 $B_u : l = 5$

$Y_{5,1}^{(c)}$ (732a)

$Y_{5,5}^{(c)}$ (733a)

$-Y_{5,5}^{(s)}$ (734a)

$Y_{5,3}^{(c)}$ (735a)

$-Y_{5,3}^{(s)}$ (736a)

$-Y_{5,1}^{(s)}$ (737a)

5.2.4 $B_u : l = 7$

$Y_{7,1}^{(c)}$ (738a)

$-Y_{7,1}^{(s)}$ (739a)

$Y_{7,5}^{(c)}$ (740a)

$-Y_{7,3}^{(s)}$ (741a)

$Y_{7,3}^{(c)}$ (742a)

$-Y_{7,7}^{(s)}$ (743a)

$-Y_{7,5}^{(s)}$ (744a)

$Y_{7,7}^{(c)}$ (745a)

5.2.5 $B_u : l = 9$

$-Y_{9,9}^{(s)}$ (746a)

$-Y_{9,7}^{(s)}$ (747a)

$Y_{9,7}^{(c)}$ (748a)

$-Y_{9,1}^{(s)}$ (749a)

$-Y_{9,3}^{(s)}$ (750a)

$Y_{9,1}^{(c)}$ (751a)

$Y_{9,5}^{(c)}$ (752a)

$-Y_{9,5}^{(s)}$ (753a)

$Y_{9,9}^{(c)}$ (754a)

$Y_{9,3}^{(c)}$ (755a)

5.2.6 $B_u : l = 11$

$Y_{11,11}^{(c)}$ (756a)

$Y_{11,5}^{(c)}$ (757a)

$Y_{11,1}^{(c)}$ (758a)

$-Y_{11,3}^{(s)}$ (759a)

$-Y_{11,11}^{(s)}$ (760a)

$Y_{11,3}^{(c)}$ (761a)

$-Y_{11,1}^{(s)}$ (762a)

$Y_{11,9}^{(c)}$ (763a)

$-Y_{11,9}^{(s)}$ (764a)

$-Y_{11,5}^{(s)}$ (765a)

$-Y_{11,7}^{(s)}$ (766a)

$Y_{11,7}^{(c)}$ (767a)

5.3 A_u

5.3.1 $A_u : l = 1$

$Y_{1,0}^{(c)}$ (768a)

5.3.2 $A_u : l = 3$

$-Y_{3,2}^{(s)}$ (769a)

$Y_{3,0}^{(c)}$ (770a)

$Y_{3,2}^{(c)}$ (771a)

5.3.3 $A_u : l = 5$

$Y_{5,0}^{(c)}$ (772a)

$-Y_{5,2}^{(s)}$ (773a)

$Y_{5,4}^{(c)}$ (774a)

$Y_{5,2}^{(c)}$ (775a)

$-Y_{5,4}^{(s)}$ (776a)

5.3.4 $A_u : l = 7$

$$Y_{7,2}^{(c)} \qquad (777a)$$

$$-Y_{7,6}^{(s)} \qquad (778a)$$

$$Y_{7,6}^{(c)} \qquad (779a)$$

$$-Y_{7,2}^{(s)} \qquad (780a)$$

$$-Y_{7,4}^{(s)} \qquad (781a)$$

$$Y_{7,0}^{(c)} \qquad (782a)$$

$$Y_{7,4}^{(c)} \qquad (783a)$$

5.3.5 $A_u : l = 9$

$$-Y_{9,2}^{(s)} \qquad (784a)$$

$$Y_{9,8}^{(c)} \qquad (785a)$$

$$Y_{9,2}^{(c)} \qquad (786a)$$

$$-Y_{9,6}^{(s)} \qquad (787a)$$

$$Y_{9,0}^{(c)} \qquad (788a)$$

$$Y_{9,4}^{(c)} \qquad (789a)$$

$$-Y_{9,4}^{(s)} \qquad (790a)$$

$$-Y_{9,8}^{(s)} \qquad (791a)$$

$$Y_{9,6}^{(c)} \qquad (792a)$$

5.3.6 $A_u : l = 11$

$$-Y_{11,4}^{(s)} \qquad (793a)$$

$$-Y_{11,6}^{(s)} \qquad (794a)$$

$$-Y_{11,8}^{(s)} \qquad (795a)$$

$$Y_{11,6}^{(c)} \qquad (796a)$$

$$-Y_{11,10}^{(s)} \qquad (797a)$$

$$Y_{11,2}^{(c)} \qquad (798a)$$

$$Y_{11,10}^{(c)} \qquad (799a)$$

$$Y_{11,0}^{(c)} \qquad (800a)$$

$$Y_{11,8}^{(c)} \qquad (801a)$$

$$Y_{11,4}^{(c)} \qquad (802a)$$

$$-Y_{11,2}^{(s)} \qquad (803a)$$

5.4 B_g

5.4.1 $B_g : l = 2$

$$-Y_{2,1}^{(s)} \qquad (804a)$$

$$Y_{2,1}^{(c)} \qquad (805a)$$

5.4.2 $B_g : l = 4$

$$-Y_{4,1}^{(s)} \qquad (806a)$$

$$Y_{4,3}^{(c)} \qquad (807a)$$

$$Y_{4,1}^{(c)} \qquad (808a)$$

$$-Y_{4,3}^{(s)} \qquad (809a)$$

5.4.3 $B_g : l = 6$

$$-Y_{6,5}^{(s)} \qquad (810a)$$

$$-Y_{6,1}^{(s)} \qquad (811a)$$

$$Y_{6,5}^{(c)} \qquad (812a)$$

$$-Y_{6,3}^{(s)} \qquad (813a)$$

$$Y_{6,3}^{(c)} \qquad (814a)$$

$$Y_{6,1}^{(c)} \qquad (815a)$$

5.4.4 $B_g : l = 8$

$$Y_{8,7}^{(c)} \qquad (816a)$$

$$Y_{8,1}^{(c)} \qquad (817a)$$

$$Y_{8,3}^{(c)} \qquad (818a)$$

$$-Y_{8,3}^{(s)} \qquad (819a)$$

$$-Y_{8,7}^{(s)} \qquad (820a)$$

$$-Y_{8,5}^{(s)} \qquad (821a)$$

$$-Y_{8,1}^{(s)} \qquad (822a)$$

$$Y_{8,5}^{(c)} \qquad (823a)$$

5.4.5 $B_g : l = 10$

$$Y_{10,1}^{(c)} \qquad (824a)$$

$$-Y_{10,3}^{(s)} \qquad (825a)$$

$$-Y_{10,7}^{(s)} \qquad (826a)$$

$$Y_{10,3}^{(c)} \qquad (827a)$$

$$-Y_{10,1}^{(s)} \qquad (828a)$$

$$-Y_{10,9}^{(s)} \qquad (829a)$$

$$Y_{10,7}^{(c)} \qquad (830a)$$

$$-Y_{10,5}^{(s)} \qquad (831a)$$

$$Y_{10,5}^{(c)} \qquad (832a)$$

$$Y_{10,9}^{(c)} \qquad (833a)$$

5.4.6 $B_g : l = 12$

$$Y_{12,9}^{(c)} \qquad (834a)$$

$$Y_{12,1}^{(c)} \qquad (835a)$$

$$-Y_{12,3}^{(s)} \qquad (836a)$$

$$-Y_{12,5}^{(s)} \qquad (837a)$$

$$-Y_{12,7}^{(s)} \qquad (838a)$$

$$-Y_{12,11}^{(s)} \qquad (839a)$$

$$Y_{12,7}^{(c)} \qquad (840a)$$

$$Y_{12,3}^{(c)} \qquad (841a)$$

$$-Y_{12,9}^{(s)} \qquad (842a)$$

$$Y_{12,5}^{(c)} \qquad (843a)$$

$$-Y_{12,1}^{(s)} \qquad (844a)$$

$$Y_{12,11}^{(c)} \qquad (845a)$$

6 Group D_2

6.1 A_1

6.1.1 $A_1 : l = 0$

$$Y_{0,0}^{(c)} \tag{846a}$$

6.1.2 $A_1 : l = 2$

$$Y_{2,2}^{(c)} \tag{847a}$$

$$Y_{2,0}^{(c)} \tag{848a}$$

6.1.3 $A_1 : l = 3$

$$-Y_{3,2}^{(s)} \tag{849a}$$

6.1.4 $A_1 : l = 4$

$$Y_{4,0}^{(c)} \tag{850a}$$

$$Y_{4,2}^{(c)} \tag{851a}$$

$$Y_{4,4}^{(c)} \tag{852a}$$

6.1.5 $A_1 : l = 5$

$$-Y_{5,2}^{(s)} \tag{853a}$$

$$-Y_{5,4}^{(s)} \tag{854a}$$

6.1.6 $A_1 : l = 6$

$$Y_{6,2}^{(c)} \tag{855a}$$

$$Y_{6,4}^{(c)} \tag{856a}$$

$$Y_{6,0}^{(c)} \tag{857a}$$

$$Y_{6,6}^{(c)} \tag{858a}$$

6.1.7 $A_1 : l = 7$

$$-Y_{7,6}^{(s)} \tag{859a}$$

$$-Y_{7,2}^{(s)} \tag{860a}$$

$$-Y_{7,4}^{(s)} \tag{861a}$$

6.1.8 $A_1 : l = 8$

$$Y_{8,6}^{(c)} \tag{862a}$$

$$Y_{8,8}^{(c)} \tag{863a}$$

$$Y_{8,2}^{(c)} \tag{864a}$$

$$Y_{8,0}^{(c)} \tag{865a}$$

$$Y_{8,4}^{(c)} \tag{866a}$$

6.1.9 $A_1 : l = 9$

$$-Y_{9,2}^{(s)} \tag{867a}$$

$$-Y_{9,4}^{(s)} \tag{868a}$$

$$-Y_{9,6}^{(s)} \tag{869a}$$

$$-Y_{9,8}^{(s)} \tag{870a}$$

6.1.10 $A_1 : l = 10$

$$Y_{10,2}^{(c)} \tag{871a}$$

$$Y_{10,0}^{(c)} \tag{872a}$$

$$Y_{10,6}^{(c)} \tag{873a}$$

$$Y_{10,8}^{(c)} \tag{874a}$$

$$Y_{10,4}^{(c)} \tag{875a}$$

$$Y_{10,10}^{(c)} \tag{876a}$$

6.1.11 $A_1 : l = 11$

$$-Y_{11,6}^{(s)} \tag{877a}$$

$$-Y_{11,8}^{(s)} \tag{878a}$$

$$-Y_{11,10}^{(s)} \tag{879a}$$

$$-Y_{11,4}^{(s)} \tag{880a}$$

$$-Y_{11,2}^{(s)} \tag{881a}$$

6.1.12 $A_1 : l = 12$

$$Y_{12,10}^{(c)} \tag{882a}$$

$$Y_{12,6}^{(c)} \tag{883a}$$

$$Y_{12,4}^{(c)} \tag{884a}$$

$$Y_{12,8}^{(c)} \tag{885a}$$

$$Y_{12,0}^{(c)} \tag{886a}$$

$$Y_{12,12}^{(c)} \tag{887a}$$

$$Y_{12,2}^{(c)} \tag{888a}$$

6.2 B_1

6.2.1 $B_1 : l = 1$

$$Y_{1,1}^{(c)} \tag{889a}$$

6.2.2 $B_1 : l = 2$

$$-Y_{2,1}^{(s)} \tag{890a}$$

6.2.3 $B_1 : l = 3$

$$Y_{3,3}^{(c)} \tag{891a}$$

$$Y_{3,1}^{(c)} \tag{892a}$$

6.2.4 $B_1 : l = 4$

$$-Y_{4,1}^{(s)} \tag{893a}$$

$$-Y_{4,3}^{(s)} \tag{894a}$$

6.2.5 $B_1 : l = 5$

$$Y_{5,1}^{(c)} \tag{895a}$$

$$Y_{5,3}^{(c)} \tag{896a}$$

$$Y_{5,5}^{(c)} \tag{897a}$$

6.2.6 $B_1 : l = 6$

$$-Y_{6,3}^{(s)} \tag{898a}$$

$$-Y_{6,5}^{(s)} \tag{899a}$$

$$-Y_{6,1}^{(s)} \tag{900a}$$

6.2.7 $B_1 : l = 7$

$$Y_{7,5}^{(c)} \tag{901a}$$

$$Y_{7,7}^{(c)} \tag{902a}$$

$$Y_{7,1}^{(c)} \tag{903a}$$

$$Y_{7,3}^{(c)} \tag{904a}$$

6.2.8 $B_1 : l = 8$

$$-Y_{8,7}^{(s)} \tag{905a}$$

$$-Y_{8,5}^{(s)} \tag{906a}$$

$$-Y_{8,3}^{(s)} \tag{907a}$$

$$-Y_{8,1}^{(s)} \tag{908a}$$

6.2.9 $B_1 : l = 9$

$$Y_{9,7}^{(c)} \tag{909a}$$

$$Y_{9,1}^{(c)} \tag{910a}$$

$$Y_{9,5}^{(c)} \tag{911a}$$

$$Y_{9,9}^{(c)} \tag{912a}$$

$$Y_{9,3}^{(c)} \tag{913a}$$

6.2.10 $B_1 : l = 10$

$$-Y_{10,3}^{(s)} \tag{914a}$$

$$-Y_{10,7}^{(s)} \tag{915a}$$

$$-Y_{10,1}^{(s)} \tag{916a}$$

$$-Y_{10,9}^{(s)} \tag{917a}$$

$$-Y_{10,5}^{(s)} \tag{918a}$$

6.2.11 $B_1 : l = 11$

$$Y_{11,11}^{(c)} \tag{919a}$$

$$Y_{11,5}^{(c)} \tag{920a}$$

$$Y_{11,1}^{(c)} \tag{921a}$$

$$Y_{11,3}^{(c)} \tag{922a}$$

$$Y_{11,9}^{(c)} \tag{923a}$$

$$Y_{11,7}^{(c)} \tag{924a}$$

6.2.12 $B_1 : l = 12$

$$-Y_{12,3}^{(s)} \tag{925a}$$

$$-Y_{12,5}^{(s)} \tag{926a}$$

$$-Y_{12,7}^{(s)} \tag{927a}$$

$$-Y_{12,9}^{(s)} \tag{928a}$$

$$-Y_{12,11}^{(s)} \tag{929a}$$

$$-Y_{12,1}^{(s)} \tag{930a}$$

6.3 B_2

6.3.1 $B_2 : l = 1$

$$-Y_{1,1}^{(s)} \tag{931a}$$

6.3.2 $B_2 : l = 2$

$$Y_{2,1}^{(c)} \tag{932a}$$

6.3.3 $B_2 : l = 3$

$$-Y_{3,3}^{(s)} \tag{933a}$$

$$-Y_{3,1}^{(s)} \tag{934a}$$

6.3.4 $B_2 : l = 4$

$Y_{4,3}^{(c)}$ (935a)

$Y_{4,1}^{(c)}$ (936a)

6.3.5 $B_2 : l = 5$

$-Y_{5,5}^{(s)}$ (937a)

$-Y_{5,3}^{(s)}$ (938a)

$-Y_{5,1}^{(s)}$ (939a)

6.3.6 $B_2 : l = 6$

$Y_{6,5}^{(c)}$ (940a)

$Y_{6,3}^{(c)}$ (941a)

$Y_{6,1}^{(c)}$ (942a)

6.3.7 $B_2 : l = 7$

$-Y_{7,1}^{(s)}$ (943a)

$-Y_{7,3}^{(s)}$ (944a)

$-Y_{7,7}^{(s)}$ (945a)

$-Y_{7,5}^{(s)}$ (946a)

6.3.8 $B_2 : l = 8$

$Y_{8,5}^{(c)}$ (947a)

$Y_{8,7}^{(c)}$ (948a)

$Y_{8,3}^{(c)}$ (949a)

$Y_{8,1}^{(c)}$ (950a)

6.3.9 $B_2 : l = 9$

$-Y_{9,9}^{(s)}$ (951a)

$-Y_{9,5}^{(s)}$ (952a)

$-Y_{9,1}^{(s)}$ (953a)

$-Y_{9,3}^{(s)}$ (954a)

$-Y_{9,7}^{(s)}$ (955a)

6.3.10 $B_2 : l = 10$

$Y_{10,1}^{(c)}$ (956a)

$Y_{10,3}^{(c)}$ (957a)

$Y_{10,7}^{(c)}$ (958a)

$Y_{10,5}^{(c)}$ (959a)

$Y_{10,9}^{(c)}$ (960a)

6.3.11 $B_2 : l = 11$

$-Y_{11,3}^{(s)}$ (961a)

$-Y_{11,11}^{(s)}$ (962a)

$-Y_{11,1}^{(s)}$ (963a)

$-Y_{11,9}^{(s)}$ (964a)

$-Y_{11,5}^{(s)}$ (965a)

$-Y_{11,7}^{(s)}$ (966a)

6.3.12 $B_2 : l = 12$

$Y_{12,9}^{(c)}$ (967a)

$Y_{12,1}^{(c)}$ (968a)

$Y_{12,7}^{(c)}$ (969a)

$Y_{12,3}^{(c)}$ (970a)

$Y_{12,5}^{(c)}$ (971a)

$Y_{12,11}^{(c)}$ (972a)

6.4 B_3

6.4.1 $B_3 : l = 1$

$Y_{1,0}^{(c)}$ (973a)

6.4.2 $B_3 : l = 2$

$-Y_{2,2}^{(s)}$ (974a)

6.4.3 $B_3 : l = 3$

$Y_{3,0}^{(c)}$ (975a)

$Y_{3,2}^{(c)}$ (976a)

6.4.4 $B_3 : l = 4$

$-Y_{4,4}^{(s)}$ (977a)

$-Y_{4,2}^{(s)}$ (978a)

6.4.5 $B_3 : l = 5$

$Y_{5,4}^{(c)}$ (979a)

$Y_{5,2}^{(c)}$ (980a)

$Y_{5,0}^{(c)}$ (981a)

6.4.6 $B_3 : l = 6$

$-Y_{6,4}^{(s)}$ (982a)

$-Y_{6,6}^{(s)}$ (983a)

$-Y_{6,2}^{(s)}$ (984a)

6.4.7 $B_3 : l = 7$

$Y_{7,2}^{(c)}$ (985a)

$Y_{7,6}^{(c)}$ (986a)

$Y_{7,0}^{(c)}$ (987a)

$Y_{7,4}^{(c)}$ (988a)

6.4.8 $B_3 : l = 8$

$-Y_{8,2}^{(s)}$ (989a)

$-Y_{8,6}^{(s)}$ (990a)

$-Y_{8,8}^{(s)}$ (991a)

$-Y_{8,4}^{(s)}$ (992a)

6.4.9 $B_3 : l = 9$

$Y_{9,8}^{(c)}$ (993a)

$Y_{9,2}^{(c)}$ (994a)

$Y_{9,0}^{(c)}$ (995a)

$Y_{9,4}^{(c)}$ (996a)

$Y_{9,6}^{(c)}$ (997a)

6.4.10 $B_3 : l = 10$

$-Y_{10,8}^{(s)}$ (998a)

$-Y_{10,4}^{(s)}$ (999a)

$-Y_{10,2}^{(s)}$ (1000a)

$-Y_{10,6}^{(s)}$ (1001a)

$-Y_{10,10}^{(s)}$ (1002a)

6.4.11 $B_3 : l = 11$

$Y_{11,6}^{(c)}$ (1003a)

$Y_{11,2}^{(c)}$ (1004a)

$Y_{11,10}^{(c)}$ (1005a)

$Y_{11,0}^{(c)}$ (1006a)

$Y_{11,8}^{(c)}$ (1007a)

$Y_{11,4}^{(c)}$ (1008a)

6.4.12 $B_3 : l = 12$

$-Y_{12,4}^{(s)}$ (1009a)

$-Y_{12,12}^{(s)}$ (1010a)

$-Y_{12,2}^{(s)}$ (1011a)

$-Y_{12,6}^{(s)}$ (1012a)

$-Y_{12,10}^{(s)}$ (1013a)

$-Y_{12,8}^{(s)}$ (1014a)

7 Group C_{2v}

7.1 A_1

7.1.1 $A_1 : l = 0$

$Y_{0,0}^{(c)}$ (1015a)

7.1.2 $A_1 : l = 1$

$Y_{1,0}^{(c)}$ (1016a)

7.1.3 $A_1 : l = 2$

$Y_{2,2}^{(c)}$ (1017a)

$Y_{2,0}^{(c)}$ (1018a)

7.1.4 $A_1 : l = 3$

$Y_{3,0}^{(c)}$ (1019a)

$Y_{3,2}^{(c)}$ (1020a)

7.1.5 $A_1 : l = 4$

$Y_{4,0}^{(c)}$ (1021a)

$Y_{4,2}^{(c)}$ (1022a)

$Y_{4,4}^{(c)}$ (1023a)

7.1.6 $A_1 : l = 5$

$Y_{5,4}^{(c)}$ (1024a)

$Y_{5,2}^{(c)}$ (1025a)

$Y_{5,0}^{(c)}$ (1026a)

7.1.7 $A_1 : l = 6$

$Y_{6,2}^{(c)}$ (1027a)

$Y_{6,4}^{(c)}$ (1028a)

$Y_{6,0}^{(c)}$ (1029a)

$Y_{6,6}^{(c)}$ (1030a)

7.1.8 $A_1 : l = 7$

$Y_{7,2}^{(c)}$ (1031a)

$Y_{7,6}^{(c)}$ (1032a)

$Y_{7,0}^{(c)}$ (1033a)

$Y_{7,4}^{(c)}$ (1034a)

7.1.9 $A_1 : l = 8$

$Y_{8,6}^{(c)}$ (1035a)

$Y_{8,8}^{(c)}$ (1036a)

$Y_{8,2}^{(c)}$ (1037a)

$Y_{8,0}^{(c)}$ (1038a)

$Y_{8,4}^{(c)}$ (1039a)

7.1.10 $A_1 : l = 9$

$Y_{9,8}^{(c)}$ (1040a)

$Y_{9,2}^{(c)}$ (1041a)

$Y_{9,0}^{(c)}$ (1042a)

$Y_{9,4}^{(c)}$ (1043a)

$Y_{9,6}^{(c)}$ (1044a)

7.1.11 $A_1 : l = 10$

$Y_{10,2}^{(c)}$ (1045a)

$Y_{10,0}^{(c)}$ (1046a)

$Y_{10,6}^{(c)}$ (1047a)

$Y_{10,8}^{(c)}$ (1048a)

$Y_{10,4}^{(c)}$ (1049a)

$Y_{10,10}^{(c)}$ (1050a)

7.1.12 $A_1 : l = 11$

$Y_{11,6}^{(c)}$ (1051a)

$Y_{11,2}^{(c)}$ (1052a)

$Y_{11,10}^{(c)}$ (1053a)

$Y_{11,0}^{(c)}$ (1054a)

$Y_{11,8}^{(c)}$ (1055a)

$Y_{11,4}^{(c)}$ (1056a)

7.1.13 $A_1 : l = 12$

$Y_{12,10}^{(c)}$ (1057a)

$Y_{12,6}^{(c)}$ (1058a)

$Y_{12,4}^{(c)}$ (1059a)

$Y_{12,8}^{(c)}$ (1060a)

$Y_{12,0}^{(c)}$ (1061a)

$Y_{12,12}^{(c)}$ (1062a)

$Y_{12,2}^{(c)}$ (1063a)

7.2 B_2

7.2.1 $B_2 : l = 1$

$Y_{1,1}^{(c)}$ (1064a)

7.2.2 $B_2 : l = 2$

$Y_{2,1}^{(c)}$ (1065a)

7.2.3 $B_2 : l = 3$

$Y_{3,3}^{(c)}$ (1066a)

$Y_{3,1}^{(c)}$ (1067a)

7.2.4 $B_2 : l = 4$

$Y_{4,3}^{(c)}$ (1068a)

$Y_{4,1}^{(c)}$ (1069a)

7.2.5 $B_2 : l = 5$

$Y_{5,1}^{(c)}$ (1070a)

$Y_{5,3}^{(c)}$ (1071a)

$Y_{5,5}^{(c)}$ (1072a)

7.2.6 $B_2 : l = 6$

$Y_{6,5}^{(c)}$ (1073a)

$Y_{6,3}^{(c)}$ (1074a)

$Y_{6,1}^{(c)}$ (1075a)

7.2.7 $B_2 : l = 7$

$Y_{7,5}^{(c)}$ (1076a)

$Y_{7,7}^{(c)}$ (1077a)

$Y_{7,1}^{(c)}$ (1078a)

$Y_{7,3}^{(c)}$ (1079a)

7.2.8 $B_2 : l = 8$

$Y_{8,5}^{(c)}$ (1080a)

$Y_{8,7}^{(c)}$ (1081a)

$Y_{8,3}^{(c)}$ (1082a)

$Y_{8,1}^{(c)}$ (1083a)

7.2.9 $B_2 : l = 9$

$Y_{9,7}^{(c)}$ (1084a)

$Y_{9,1}^{(c)}$ (1085a)

$Y_{9,5}^{(c)}$ (1086a)

$Y_{9,9}^{(c)}$ (1087a)

$Y_{9,3}^{(c)}$ (1088a)

7.2.10 $B_2 : l = 10$

$Y_{10,1}^{(c)}$ (1089a)

$Y_{10,3}^{(c)}$ (1090a)

$Y_{10,7}^{(c)}$ (1091a)

$Y_{10,5}^{(c)}$ (1092a)

$Y_{10,9}^{(c)}$ (1093a)

7.2.11 $B_2 : l = 11$

$Y_{11,11}^{(c)}$ (1094a)

$Y_{11,5}^{(c)}$ (1095a)

$Y_{11,1}^{(c)}$ (1096a)

$Y_{11,3}^{(c)}$ (1097a)

$Y_{11,9}^{(c)}$ (1098a)

$Y_{11,7}^{(c)}$ (1099a)

7.2.12 $B_2 : l = 12$

$Y_{12,9}^{(c)}$ (1100a)

$Y_{12,1}^{(c)}$ (1101a)

$Y_{12,7}^{(c)}$ (1102a)

$Y_{12,3}^{(c)}$ (1103a)

$Y_{12,5}^{(c)}$ (1104a)

$Y_{12,11}^{(c)}$ (1105a)

7.3 B_1

7.3.1 $B_1 : l = 1$

$$-Y_{1,1}^{(s)}$$ (1106a)

7.3.2 $B_1 : l = 2$

$$-Y_{2,1}^{(s)}$$ (1107a)

7.3.3 $B_1 : l = 3$

$$-Y_{3,3}^{(s)}$$ (1108a)

$$-Y_{3,1}^{(s)}$$ (1109a)

7.3.4 $B_1 : l = 4$

$$-Y_{4,1}^{(s)}$$ (1110a)

$$-Y_{4,3}^{(s)}$$ (1111a)

7.3.5 $B_1 : l = 5$

$$-Y_{5,5}^{(s)}$$ (1112a)

$$-Y_{5,3}^{(s)}$$ (1113a)

$$-Y_{5,1}^{(s)}$$ (1114a)

7.3.6 $B_1 : l = 6$

$$-Y_{6,3}^{(s)}$$ (1115a)

$$-Y_{6,5}^{(s)}$$ (1116a)

$$-Y_{6,1}^{(s)}$$ (1117a)

7.3.7 $B_1 : l = 7$

$$-Y_{7,1}^{(s)}$$ (1118a)

$$-Y_{7,3}^{(s)}$$ (1119a)

$$-Y_{7,7}^{(s)}$$ (1120a)

$$-Y_{7,5}^{(s)}$$ (1121a)

7.3.8 $B_1 : l = 8$

$$-Y_{8,7}^{(s)}$$ (1122a)

$$-Y_{8,5}^{(s)}$$ (1123a)

$$-Y_{8,3}^{(s)}$$ (1124a)

$$-Y_{8,1}^{(s)}$$ (1125a)

7.3.9 $B_1 : l = 9$

$$-Y_{9,9}^{(s)}$$ (1126a)

$$-Y_{9,5}^{(s)}$$ (1127a)

$$-Y_{9,1}^{(s)}$$ (1128a)

$$-Y_{9,3}^{(s)}$$ (1129a)

$$-Y_{9,7}^{(s)}$$ (1130a)

7.3.10 $B_1 : l = 10$

$$-Y_{10,3}^{(s)}$$ (1131a)

$$-Y_{10,7}^{(s)}$$ (1132a)

$$-Y_{10,1}^{(s)}$$ (1133a)

$$-Y_{10,9}^{(s)}$$ (1134a)

$$-Y_{10,5}^{(s)}$$ (1135a)

7.3.11 $B_1 : l = 11$

$$-Y_{11,3}^{(s)}$$ (1136a)

$$-Y_{11,11}^{(s)}$$ (1137a)

$$-Y_{11,1}^{(s)}$$ (1138a)

$$-Y_{11,9}^{(s)}$$ (1139a)

$$-Y_{11,5}^{(s)}$$ (1140a)

$$-Y_{11,7}^{(s)}$$ (1141a)

7.3.12 $B_1 : l = 12$

$$-Y_{12,3}^{(s)}$$ (1142a)

$$-Y_{12,5}^{(s)}$$ (1143a)

$$-Y_{12,7}^{(s)}$$ (1144a)

$$-Y_{12,9}^{(s)}$$ (1145a)

$$-Y_{12,11}^{(s)}$$ (1146a)

$$-Y_{12,1}^{(s)}$$ (1147a)

7.4 A_2

7.4.1 $A_2 : l = 2$

$$-Y_{2,2}^{(s)}$$ (1148a)

7.4.2 $A_2 : l = 3$

$$-Y_{3,2}^{(s)}$$ (1149a)

7.4.3 $A_2 : l = 4$

$$-Y_{4,4}^{(s)}$$ (1150a)

$$-Y_{4,2}^{(s)}$$ (1151a)

7.4.4 $A_2 : l = 5$

$$-Y_{5,2}^{(s)}$$ (1152a)

$$-Y_{5,4}^{(s)}$$ (1153a)

7.4.5 $A_2 : l = 6$

$$-Y_{6,4}^{(s)}$$ (1154a)

$$-Y_{6,6}^{(s)}$$ (1155a)

$$-Y_{6,2}^{(s)}$$ (1156a)

7.4.6 $A_2 : l = 7$

$$-Y_{7,6}^{(s)}$$ (1157a)

$$-Y_{7,2}^{(s)}$$ (1158a)

$$-Y_{7,4}^{(s)}$$ (1159a)

7.4.7 $A_2 : l = 8$

$$-Y_{8,2}^{(s)}$$ (1160a)

$$-Y_{8,6}^{(s)}$$ (1161a)

$$-Y_{8,8}^{(s)}$$ (1162a)

$$-Y_{8,4}^{(s)}$$ (1163a)

7.4.8 $A_2 : l = 9$

$$-Y_{9,2}^{(s)}$$ (1164a)

$$-Y_{9,4}^{(s)}$$ (1165a)

$$-Y_{9,6}^{(s)}$$ (1166a)

$$-Y_{9,8}^{(s)}$$ (1167a)

7.4.9 $A_2 : l = 10$

$$-Y_{10,8}^{(s)}$$ (1168a)

$$-Y_{10,4}^{(s)}$$ (1169a)

$$-Y_{10,2}^{(s)}$$ (1170a)

$$-Y_{10,6}^{(s)}$$ (1171a)

$$-Y_{10,10}^{(s)}$$ (1172a)

7.4.10 $A_2 : l = 11$

$$-Y_{11,6}^{(s)}$$ (1173a)

$$-Y_{11,8}^{(s)}$$ (1174a)

$$-Y_{11,10}^{(s)}$$ (1175a)

$$-Y_{11,4}^{(s)}$$ (1176a)

$$-Y_{11,2}^{(s)}$$ (1177a)

7.4.11 $A_2 : l = 12$

$$-Y_{12,4}^{(s)}$$ (1178a)

$$-Y_{12,12}^{(s)}$$ (1179a)

$$-Y_{12,2}^{(s)}$$ (1180a)

$$-Y_{12,6}^{(s)}$$ (1181a)

$$-Y_{12,10}^{(s)}$$ (1182a)

$$-Y_{12,8}^{(s)}$$ (1183a)

8 Group D_{2h}

8.1 A_{1g}

8.1.1 $A_{1g} : l = 0$

$$Y_{0,0}^{(c)}$$

(1184a)

8.1.2 $A_{1g} : l = 2$

$$-Y_{2,1}^{(s)}$$

(1185a)

$$\frac{Y_{2,0}^{(c)}}{2} - \frac{\sqrt{3}Y_{2,2}^{(c)}}{2}$$

(1186a)

8.1.3 $A_{1g} : l = 4$

$$\frac{\sqrt{2}Y_{4,1}^{(s)}}{4} - \frac{\sqrt{14}Y_{4,3}^{(s)}}{4}$$

(1187a)

$$\frac{\sqrt{35}Y_{4,0}^{(c)}}{12} - \frac{\sqrt{7}Y_{4,2}^{(c)}}{6} + \frac{3Y_{4,4}^{(c)}}{4}$$

(1188a)

$$\frac{2Y_{4,0}^{(c)}}{3} + \frac{\sqrt{5}Y_{4,2}^{(c)}}{3}$$

(1189a)

8.1.4 $A_{1g} : l = 6$

$$-\frac{3\sqrt{85}Y_{6,1}^{(s)}}{68} - \frac{\sqrt{34}Y_{6,3}^{(s)}}{8} + \frac{\sqrt{5610}Y_{6,5}^{(s)}}{136}$$

(1190a)

$$\frac{\sqrt{22}Y_{6,0}^{(c)}}{8} - \frac{\sqrt{1155}Y_{6,2}^{(c)}}{88} - \frac{3\sqrt{154}Y_{6,4}^{(c)}}{88} - \frac{\sqrt{21}Y_{6,6}^{(c)}}{8}$$

(1191a)

$$\frac{\sqrt{165}Y_{6,2}^{(c)}}{44} - \frac{2\sqrt{22}Y_{6,4}^{(c)}}{11} + \frac{\sqrt{3}Y_{6,6}^{(c)}}{4}$$

(1192a)

$$-\frac{\sqrt{187}Y_{6,1}^{(s)}}{17} - \frac{\sqrt{102}Y_{6,5}^{(s)}}{17}$$

(1193a)

8.1.5 $A_{1g} : l = 8$

$$\frac{\sqrt{92235}Y_{8,0}^{(c)}}{688} - \frac{\sqrt{258258}Y_{8,2}^{(c)}}{1032} + \frac{\sqrt{58695}Y_{8,4}^{(c)}}{1032} - \frac{\sqrt{430}Y_{8,6}^{(c)}}{344} + \frac{\sqrt{129}Y_{8,8}^{(c)}}{16}$$

(1194a)

$$\frac{\sqrt{817}Y_{8,0}^{(c)}}{43} + \frac{17\sqrt{57190}Y_{8,2}^{(c)}}{6536} + \frac{\sqrt{62909}Y_{8,4}^{(c)}}{1634} + \frac{3\sqrt{700986}Y_{8,6}^{(c)}}{6536}$$

(1195a)

$$-\frac{\sqrt{58}Y_{8,1}^{(s)}}{16} + \frac{\sqrt{66990}Y_{8,3}^{(s)}}{464} + \frac{\sqrt{58058}Y_{8,5}^{(s)}}{464} + \frac{\sqrt{41470}Y_{8,7}^{(s)}}{464}$$

(1196a)

$$-\frac{\sqrt{754}Y_{8,3}^{(s)}}{116} + \frac{3\sqrt{870}Y_{8,5}^{(s)}}{116} - \frac{\sqrt{1218}Y_{8,7}^{(s)}}{58}$$

(1197a)

$$\frac{\sqrt{6270}Y_{8,2}^{(c)}}{228} + \frac{4\sqrt{57}Y_{8,4}^{(c)}}{57} - \frac{\sqrt{3458}Y_{8,6}^{(c)}}{76}$$

(1198a)

8.1.6 $A_{1g} : l = 10$

$$-\frac{3\sqrt{30719}Y_{10,1}^{(s)}}{2224} + \frac{11\sqrt{14178}Y_{10,3}^{(s)}}{6672} + \frac{7\sqrt{70890}Y_{10,5}^{(s)}}{6672} - \frac{\sqrt{834}Y_{10,7}^{(s)}}{32} + \frac{7\sqrt{5282}Y_{10,9}^{(s)}}{4448}$$

(1199a)

$$-\frac{7\sqrt{45210}Y_{10,0}^{(c)}}{4384} + \frac{\sqrt{8628945}Y_{10,10}^{(c)}}{4384} + \frac{\sqrt{274}Y_{10,2}^{(c)}}{32} - \frac{13\sqrt{3562}Y_{10,4}^{(c)}}{2192} - \frac{19\sqrt{1781}Y_{10,6}^{(c)}}{4384} + \frac{\sqrt{181662}Y_{10,8}^{(c)}}{4384}$$

(1200a)

$$-\frac{435\sqrt{15083029}Y_{10,1}^{(s)}}{4640932} - \frac{\sqrt{6961398}Y_{10,3}^{(s)}}{3336} + \frac{223\sqrt{34806990}Y_{10,5}^{(s)}}{27845592} + \frac{83\sqrt{2593462}Y_{10,9}^{(s)}}{272996}$$

(1201a)

$$\frac{\sqrt{1257386}Y_{10,0}^{(c)}}{2192} - \frac{\sqrt{171826633}Y_{10,10}^{(c)}}{96722} - \frac{57\sqrt{15959130}Y_{10,4}^{(c)}}{386888} - \frac{17\sqrt{7979565}Y_{10,6}^{(c)}}{96722} - \frac{29\sqrt{90435070}Y_{10,8}^{(c)}}{773776}$$

(1202a)

$$-\frac{7\sqrt{792965}Y_{10,1}^{(s)}}{8347} - \frac{\sqrt{12370254}Y_{10,5}^{(s)}}{8347} - \frac{\sqrt{63830}Y_{10,9}^{(s)}}{491}$$

(1203a)

$$-\frac{\sqrt{67070}Y_{10,10}^{(c)}}{1412} + \frac{\sqrt{18003}Y_{10,4}^{(c)}}{706} - \frac{5\sqrt{36006}Y_{10,6}^{(c)}}{1412} + \frac{13\sqrt{353}Y_{10,8}^{(c)}}{353}$$

(1204a)

8.1.7 $A_{1g} : l = 12$

$$-\frac{7\sqrt{4197270}Y_{12,11}^{(s)}}{75840} + \frac{\sqrt{4210305}Y_{12,1}^{(s)}}{7584} - \frac{\sqrt{893095}Y_{12,3}^{(s)}}{12640} - \frac{27\sqrt{105070}Y_{12,5}^{(s)}}{25280} - \frac{\sqrt{2370}Y_{12,7}^{(s)}}{64} + \frac{147\sqrt{5530}Y_{12,9}^{(s)}}{25280}$$

(1205a)

$$\frac{\sqrt{583338}Y_{12,0}^{(c)}}{2752} + \frac{\sqrt{559}Y_{12,10}^{(c)}}{32} - \frac{\sqrt{38571}Y_{12,12}^{(c)}}{35776} - \frac{\sqrt{3972254}Y_{12,2}^{(c)}}{17888} - \frac{5\sqrt{5958381}Y_{12,4}^{(c)}}{35776} + \frac{5\sqrt{2453451}Y_{12,6}^{(c)}}{17888} - \frac{29\sqrt{86086}Y_{12,8}^{(c)}}{35776}$$

(1206a)

$$\frac{151\sqrt{32548629630}Y_{12,11}^{(s)}}{54168720} + \frac{7\sqrt{4431678405}Y_{12,1}^{(s)}}{2708436} + \frac{297\sqrt{19184755}Y_{12,3}^{(s)}}{9028120} - \frac{3\sqrt{2257030}Y_{12,5}^{(s)}}{6320} - \frac{299\sqrt{42883570}Y_{12,9}^{(s)}}{4514060}$$

(1207a)

$$-\frac{\sqrt{63673959}Y_{12,11}^{(s)}}{17142} + \frac{41\sqrt{119994}Y_{12,1}^{(s)}}{34284} - \frac{25\sqrt{62854}Y_{12,3}^{(s)}}{11428} - \frac{\sqrt{10150921}Y_{12,9}^{(s)}}{5714}$$

(1208a)

$$\frac{6615\sqrt{1675296469}Y_{12,0}^{(c)}}{696227104} + \frac{831\sqrt{46227173453318}Y_{12,12}^{(c)}}{18101904704} + \frac{4305\sqrt{848526783}Y_{12,2}^{(c)}}{565684522} + \frac{\sqrt{565684522}Y_{12,4}^{(c)}}{35776} + \frac{123\sqrt{67316458118}Y_{12,6}^{(c)}}{565684522} - \frac{3313\sqrt{1918519056363}Y_{12,8}^{(c)}}{9050952352}$$

(1209a)

$$\frac{1555\sqrt{182768722422}Y_{12,0}^{(c)}}{5112411816} - \frac{17\sqrt{36555853354274I}Y_{12,12}^{(c)}}{639051477} + \frac{15\sqrt{2982240226}Y_{12,2}^{(c)}}{1011958} + \frac{\sqrt{108638875109}Y_{12,6}^{(c)}}{505979} + \frac{751\sqrt{137609084714}Y_{12,8}^{(c)}}{1704137272}$$

(1210a)

$$\frac{\sqrt{9382827}Y_{12,0}^{(c)}}{5052} + \frac{\sqrt{229866}Y_{12,12}^{(c)}}{1263} + \frac{\sqrt{1384669}Y_{12,8}^{(c)}}{1684}$$

(1211a)

8.2 B_{3u}

8.2.1 $B_{3u} : l = 1$

$$Y_{1,1}^{(c)}$$
(1212a)

8.2.2 $B_{3u} : l = 3$

$$\frac{\sqrt{6}Y_{3,1}^{(c)}}{4} - \frac{\sqrt{10}Y_{3,3}^{(c)}}{4}$$
(1213a)

$$-Y_{3,2}^{(s)}$$
(1214a)

8.2.3 $B_{3u} : l = 5$

$$\frac{\sqrt{609}Y_{5,1}^{(c)}}{116} + \frac{\sqrt{58}Y_{5,3}^{(c)}}{8} - \frac{3\sqrt{290}Y_{5,5}^{(c)}}{232}$$
(1215a)

$$\frac{\sqrt{435}Y_{5,1}^{(c)}}{29} + \frac{\sqrt{406}Y_{5,5}^{(c)}}{29}$$
(1216a)

$$-\frac{Y_{5,2}^{(s)}}{2} + \frac{\sqrt{3}Y_{5,4}^{(s)}}{2}$$
(1217a)

8.2.4 $B_{3u} : l = 7$

$$-\frac{\sqrt{66}Y_{7,2}^{(s)}}{24} - \frac{\sqrt{3}Y_{7,4}^{(s)}}{2} + \frac{\sqrt{78}Y_{7,6}^{(s)}}{24}$$
(1218a)

$$-\frac{\sqrt{78}Y_{7,2}^{(s)}}{12} - \frac{\sqrt{66}Y_{7,6}^{(s)}}{12}$$
(1219a)

$$-\frac{9\sqrt{6}Y_{7,1}^{(c)}}{80} + \frac{5\sqrt{2}Y_{7,3}^{(c)}}{16} - \frac{11\sqrt{22}Y_{7,5}^{(c)}}{80} + \frac{\sqrt{2002}Y_{7,7}^{(c)}}{80}$$
(1220a)

$$\frac{\sqrt{154}Y_{7,1}^{(c)}}{20} - \frac{\sqrt{42}Y_{7,5}^{(c)}}{10} - \frac{\sqrt{78}Y_{7,7}^{(c)}}{20}$$
(1221a)

8.2.5 $B_{3u} : l = 9$

$$\frac{7\sqrt{49335}Y_{9,1}^{(c)}}{5520} + \frac{3\sqrt{20930}Y_{9,3}^{(c)}}{1840} - \frac{41\sqrt{138}Y_{9,5}^{(c)}}{1104} + \frac{\sqrt{690}Y_{9,7}^{(c)}}{32} - \frac{\sqrt{11730}Y_{9,9}^{(c)}}{3680}$$
(1222a)

$$\frac{3\sqrt{7287665}Y_{9,1}^{(c)}}{378580} + \frac{\sqrt{567870}Y_{9,3}^{(c)}}{920} + \frac{39\sqrt{3445078}Y_{9,5}^{(c)}}{151432} - \frac{7\sqrt{292831630}Y_{9,9}^{(c)}}{378580}$$
(1223a)

$$\frac{\sqrt{2728245}Y_{9,1}^{(c)}}{2469} + \frac{\sqrt{923406}Y_{9,5}^{(c)}}{2469} + \frac{\sqrt{271590}Y_{9,9}^{(c)}}{823}$$
(1224a)

$$\frac{\sqrt{13}Y_{9,2}^{(s)}}{8} - \frac{\sqrt{14}Y_{9,4}^{(s)}}{8} + \frac{\sqrt{3}Y_{9,6}^{(s)}}{8} - \frac{\sqrt{34}Y_{9,8}^{(s)}}{8}$$
(1225a)

$$\frac{\sqrt{3}Y_{9,2}^{(s)}}{4} - \frac{\sqrt{13}Y_{9,6}^{(s)}}{4}$$
(1226a)

8.2.6 $B_{3u} : l = 11$

$$\frac{5\sqrt{82}Y_{11,11}^{(c)}}{64} - \frac{\sqrt{13256243}Y_{11,1}^{(c)}}{6560} + \frac{3\sqrt{728365}Y_{11,3}^{(c)}}{6560} - \frac{\sqrt{6118266}Y_{11,5}^{(c)}}{13120} + \frac{\sqrt{599830}Y_{11,7}^{(c)}}{13120} - \frac{\sqrt{18942}Y_{11,9}^{(c)}}{13120}$$
(1227a)

$$\frac{\sqrt{461127}Y_{11,1}^{(c)}}{1640} + \frac{79\sqrt{209812785}Y_{11,3}^{(c)}}{3074180} - \frac{789\sqrt{3996434}Y_{11,5}^{(c)}}{3074180} - \frac{119\sqrt{1019090670}Y_{11,7}^{(c)}}{12296720} - \frac{197\sqrt{1290848182}Y_{11,9}^{(c)}}{12296720}$$
(1228a)

$$\frac{7\sqrt{157458}Y_{11,3}^{(c)}}{14996} + \frac{5\sqrt{18745}Y_{11,5}^{(c)}}{7498} - \frac{29\sqrt{191199}Y_{11,7}^{(c)}}{14996} + \frac{3\sqrt{6054635}Y_{11,9}^{(c)}}{14996}$$
(1229a)

$$\frac{\sqrt{210}Y_{11,10}^{(s)}}{192} - \frac{\sqrt{969}Y_{11,2}^{(s)}}{96} + \frac{\sqrt{570}Y_{11,6}^{(s)}}{64} - \frac{\sqrt{3}Y_{11,8}^{(s)}}{2}$$
(1230a)

$$\frac{\sqrt{646}Y_{11,10}^{(s)}}{64} - \frac{\sqrt{35}Y_{11,2}^{(s)}}{32} - \frac{\sqrt{3}Y_{11,4}^{(s)}}{2} - \frac{\sqrt{238}Y_{11,6}^{(s)}}{64}$$
(1231a)

$$-\frac{\sqrt{798}Y_{11,10}^{(s)}}{48} - \frac{\sqrt{255}Y_{11,2}^{(s)}}{24} - \frac{3\sqrt{6}Y_{11,6}^{(s)}}{16}$$
(1232a)

8.3 B_{1u}

8.3.1 $B_{1u} : l = 1$

$$\frac{\sqrt{2}Y_{1,0}^{(c)}}{2} - \frac{\sqrt{2}Y_{1,1}^{(s)}}{2}$$
(1233a)

8.3.2 $B_{1u} : l = 3$

$$-\frac{\sqrt{3}Y_{3,0}^{(c)}}{4} - \frac{\sqrt{2}Y_{3,1}^{(s)}}{2} - \frac{\sqrt{5}Y_{3,2}^{(c)}}{4}$$
(1234a)

$$-\frac{\sqrt{5}Y_{3,0}^{(c)}}{4} + \frac{\sqrt{3}Y_{3,2}^{(c)}}{4} - \frac{\sqrt{2}Y_{3,3}^{(s)}}{2}$$
(1235a)

8.3.3 $B_{1u} : l = 5$

$$\frac{\sqrt{30}Y_{5,0}^{(c)}}{16} - \frac{\sqrt{2}Y_{5,1}^{(s)}}{2} + \frac{\sqrt{14}Y_{5,2}^{(c)}}{8} + \frac{\sqrt{42}Y_{5,4}^{(c)}}{16}$$

(1236a)

$$\frac{3\sqrt{7}Y_{5,0}^{(c)}}{16} - \frac{\sqrt{15}Y_{5,2}^{(c)}}{8} + \frac{\sqrt{5}Y_{5,4}^{(c)}}{16} - \frac{\sqrt{2}Y_{5,5}^{(s)}}{2}$$

(1237a)

$$\frac{\sqrt{35}Y_{5,0}^{(c)}}{16} + \frac{\sqrt{3}Y_{5,2}^{(c)}}{8} - \frac{\sqrt{2}Y_{5,3}^{(s)}}{2} - \frac{9Y_{5,4}^{(c)}}{16}$$

(1238a)

8.3.4 $B_{1u} : l = 7$

$$-\frac{\sqrt{858}Y_{7,0}^{(c)}}{64} + \frac{\sqrt{1001}Y_{7,2}^{(c)}}{64} - \frac{\sqrt{182}Y_{7,4}^{(c)}}{64} + \frac{\sqrt{7}Y_{7,6}^{(c)}}{64} - \frac{\sqrt{2}Y_{7,7}^{(s)}}{2}$$

(1239a)

$$\frac{\sqrt{1190}Y_{7,0}^{(c)}}{64} + \frac{\sqrt{170}Y_{7,1}^{(s)}}{34} + \frac{143\sqrt{255}Y_{7,2}^{(c)}}{5440} + \frac{3\sqrt{510}Y_{7,3}^{(s)}}{170} - \frac{13\sqrt{5610}Y_{7,4}^{(c)}}{5440} + \frac{\sqrt{5610}Y_{7,5}^{(s)}}{170} + \frac{\sqrt{36465}Y_{7,6}^{(c)}}{5440}$$

(1240a)

$$\frac{3\sqrt{7395}Y_{7,1}^{(s)}}{986} - \frac{41\sqrt{4930}Y_{7,2}^{(c)}}{39440} - \frac{\sqrt{2465}Y_{7,3}^{(s)}}{85} - \frac{\sqrt{27115}Y_{7,4}^{(c)}}{4930} + \frac{9\sqrt{27115}Y_{7,5}^{(s)}}{4930} + \frac{33\sqrt{704990}Y_{7,6}^{(c)}}{39440}$$

(1241a)

$$\frac{\sqrt{957}Y_{7,1}^{(s)}}{58} + \frac{5\sqrt{638}Y_{7,2}^{(c)}}{464} + \frac{7\sqrt{29}Y_{7,4}^{(c)}}{58} - \frac{5\sqrt{29}Y_{7,5}^{(s)}}{58} + \frac{\sqrt{754}Y_{7,6}^{(c)}}{464}$$

(1242a)

8.3.5 $B_{1u} : l = 9$

$$-\frac{\sqrt{4862}Y_{9,1}^{(s)}}{256} + \frac{\sqrt{4641}Y_{9,3}^{(s)}}{128} - \frac{5\sqrt{85}Y_{9,5}^{(s)}}{128} + \frac{7\sqrt{17}Y_{9,7}^{(s)}}{256} + \frac{\sqrt{2}Y_{9,8}^{(c)}}{2} - \frac{3Y_{9,9}^{(s)}}{256}$$

(1243a)

$$-\frac{7\sqrt{11}Y_{9,1}^{(s)}}{64} + \frac{\sqrt{2}Y_{9,2}^{(c)}}{2} - \frac{3\sqrt{42}Y_{9,3}^{(s)}}{64} - \frac{\sqrt{130}Y_{9,5}^{(s)}}{64} + \frac{\sqrt{26}Y_{9,7}^{(s)}}{128} + \frac{3\sqrt{442}Y_{9,9}^{(s)}}{128}$$

(1244a)

$$\frac{21\sqrt{96410}Y_{9,0}^{(c)}}{19282} - \frac{\sqrt{19282}Y_{9,1}^{(s)}}{256} - \frac{53\sqrt{2227071}Y_{9,3}^{(s)}}{1234048} + \frac{\sqrt{19301282}Y_{9,4}^{(c)}}{9641} + \frac{141\sqrt{6893315}Y_{9,5}^{(s)}}{1234048} + \frac{2\sqrt{4135989}Y_{9,6}^{(c)}}{9641} - \frac{175\sqrt{1378663}Y_{9,7}^{(s)}}{2468096} - \frac{165\sqrt{2343727I}Y_{9,9}^{(s)}}{2468096}$$

(1245a)

$$-\frac{6\sqrt{128401778505}Y_{9,0}^{(c)}}{8551567} + \frac{5695\sqrt{222340742}Y_{9,3}^{(s)}}{273650144} - \frac{572\sqrt{25654701}Y_{9,4}^{(c)}}{8551567} + \frac{2003\sqrt{1795829070}Y_{9,5}^{(s)}}{273650144} + \frac{\sqrt{119721938}Y_{9,6}^{(c)}}{19282} - \frac{6337\sqrt{359165814}Y_{9,7}^{(s)}}{273650144} + \frac{1187\sqrt{6105818838}Y_{9,9}^{(s)}}{273650144}$$

(1246a)

$$\frac{\sqrt{253682}Y_{9,0}^{(c)}}{887} - \frac{\sqrt{1210755}Y_{9,3}^{(s)}}{7096} - \frac{3\sqrt{62090}Y_{9,4}^{(c)}}{1774} - \frac{93\sqrt{887}Y_{9,5}^{(s)}}{7096} - \frac{57\sqrt{4435}Y_{9,7}^{(s)}}{7096} - \frac{5\sqrt{75395}Y_{9,9}^{(s)}}{7096}$$

(1247a)

8.3.6 $B_{1u} : l = 11$

$$\frac{\sqrt{2}Y_{11,10}^{(c)}}{2} - \frac{\sqrt{11}Y_{11,11}^{(s)}}{1024} + \frac{\sqrt{58786}Y_{11,1}^{(s)}}{1024} - \frac{9\sqrt{3230}Y_{11,3}^{(s)}}{1024} + \frac{5\sqrt{6783}Y_{11,5}^{(s)}}{1024} - \frac{7\sqrt{665}Y_{11,7}^{(s)}}{1024} + \frac{9\sqrt{21}Y_{11,9}^{(s)}}{1024}$$

(1248a)

$$\frac{\sqrt{2}Y_{11,0}^{(c)}}{2} + \frac{\sqrt{176358}Y_{11,11}^{(s)}}{1024} + \frac{21\sqrt{33}Y_{11,1}^{(s)}}{512} + \frac{\sqrt{15015}Y_{11,3}^{(s)}}{512} + \frac{15\sqrt{286}Y_{11,5}^{(s)}}{1024} + \frac{\sqrt{72930}Y_{11,7}^{(s)}}{1024} + \frac{\sqrt{92378}Y_{11,9}^{(s)}}{1024}$$

(1249a)

$$\frac{385\sqrt{21664854519}Y_{11,11}^{(s)}}{297331712} + \frac{18235\sqrt{22648314}Y_{11,1}^{(s)}}{297331712} - \frac{41\sqrt{4355445}Y_{11,2}^{(c)}}{290363} - \frac{10245\sqrt{60976230}Y_{11,3}^{(s)}}{297331712} + \frac{26\sqrt{2032541}Y_{11,4}^{(c)}}{290363}$$
$$- \frac{\sqrt{290363}Y_{11,5}^{(s)}}{1024} + \frac{53\sqrt{29617026}Y_{11,6}^{(c)}}{580726} - \frac{365\sqrt{74042565}Y_{11,7}^{(s)}}{297331712} + \frac{3\sqrt{1406808735}Y_{11,8}^{(c)}}{290363} + \frac{5235\sqrt{93787249}Y_{11,9}^{(s)}}{297331712}$$

(1250a)

$$\frac{6029011\sqrt{111698221548606}Y_{11,1}^{(s)}}{255310220682528} + \frac{645575\sqrt{3045589820016861}Y_{11,1}^{(s)}}{170206813788352} + \frac{4733\sqrt{2342761400012970}Y_{11,2}^{(c)}}{7978444396329} + \frac{23015\sqrt{8199664900045395}Y_{11,3}^{(s)}}{255310220682528}$$
$$+ \frac{359\sqrt{1093288653339386}Y_{11,4}^{(c)}}{24398912527} - \frac{812213\sqrt{13780949411841}Y_{11,6}^{(c)}}{7978444396329} + \frac{9775091\sqrt{137809494118410}Y_{11,7}^{(s)}}{1021240882730112} + \frac{683203\sqrt{7253131269390}Y_{11,8}^{(c)}}{5318962930886} - \frac{33\sqrt{483542084626}Y_{11,9}^{(s)}}{37166464}$$

(1251a)

$$\frac{7045\sqrt{6123329746454415}Y_{11,11}^{(s)}}{3791535446721} - \frac{28484\sqrt{313663386956010}Y_{11,1}^{(s)}}{1263845148907} - \frac{3617639\sqrt{2412795284277}Y_{11,2}^{(c)}}{15166141786884} - \frac{23\sqrt{689370081222}Y_{11,3}^{(s)}}{54954966}$$
$$- \frac{26071\sqrt{574475067685}Y_{11,4}^{(c)}}{46379638492} - \frac{243299\sqrt{4101751983270090}Y_{11,6}^{(c)}}{15166141786884} + \frac{263950\sqrt{4101751983270909}Y_{11,7}^{(s)}}{3791535446721} + \frac{24901\sqrt{779332876821471}Y_{11,8}^{(c)}}{2527690297814}$$

(1252a)

$$\frac{2\sqrt{1009374905}Y_{11,11}^{(s)}}{137987} - \frac{5\sqrt{304951270}Y_{11,1}^{(s)}}{275974} - \frac{189\sqrt{2345779}Y_{11,2}^{(c)}}{551948} + \frac{9\sqrt{246306795}Y_{11,4}^{(c)}}{551948} - \frac{33\sqrt{1379870}Y_{11,6}^{(c)}}{551948} - \frac{161\sqrt{137987}Y_{11,7}^{(s)}}{137987} - \frac{67\sqrt{2621753}Y_{11,8}^{(c)}}{275974}$$

(1253a)

8.4 B_{2u}

8.4.1 $B_{2u} : l = 1$

$$\frac{\sqrt{2}Y_{1,0}^{(c)}}{2} + \frac{\sqrt{2}Y_{1,1}^{(s)}}{2}$$

(1254a)

8.4.2 $B_{2u} : l = 3$

$$-\frac{\sqrt{5}Y_{3,1}^{(s)}}{4} + \frac{\sqrt{2}Y_{3,2}^{(c)}}{2} + \frac{\sqrt{3}Y_{3,3}^{(s)}}{4}$$

(1255a)

$$\frac{\sqrt{2}Y_{3,0}^{(c)}}{2} - \frac{\sqrt{3}Y_{3,1}^{(s)}}{4} - \frac{\sqrt{5}Y_{3,3}^{(s)}}{4}$$

(1256a)

8.4.3 $B_{2u} : l = 5$

$$\frac{\sqrt{2}Y_{5,0}^{(c)}}{2} + \frac{\sqrt{30}Y_{5,1}^{(s)}}{16} + \frac{\sqrt{35}Y_{5,3}^{(s)}}{16} + \frac{3\sqrt{7}Y_{5,5}^{(s)}}{16}$$

(1257a)

$$\frac{\sqrt{42}Y_{5,1}^{(s)}}{16} - \frac{9Y_{5,3}^{(s)}}{16} + \frac{\sqrt{2}Y_{5,4}^{(c)}}{2} + \frac{\sqrt{5}Y_{5,5}^{(s)}}{16}$$

(1258a)

$$-\frac{\sqrt{14}Y_{5,1}^{(s)}}{8} - \frac{\sqrt{2}Y_{5,2}^{(c)}}{2} - \frac{\sqrt{3}Y_{5,3}^{(s)}}{8} + \frac{\sqrt{15}Y_{5,5}^{(s)}}{8}$$

(1259a)

8.4.4 $B_{2u} : l = 7$

$$-\frac{3\sqrt{66}Y_{7,1}^{(s)}}{64} + \frac{\sqrt{22}Y_{7,3}^{(s)}}{64} + \frac{\sqrt{2}Y_{7,4}^{(c)}}{2} + \frac{25\sqrt{2}Y_{7,5}^{(s)}}{64} - \frac{\sqrt{182}Y_{7,7}^{(s)}}{64}$$

(1260a)

$$\frac{\sqrt{2}Y_{7,0}^{(c)}}{2} - \frac{5\sqrt{14}Y_{7,1}^{(s)}}{64} - \frac{3\sqrt{42}Y_{7,3}^{(s)}}{64} - \frac{\sqrt{462}Y_{7,5}^{(s)}}{64} - \frac{\sqrt{858}Y_{7,7}^{(s)}}{64}$$

(1261a)

$$-\frac{5\sqrt{77}Y_{7,1}^{(s)}}{112} + \frac{\sqrt{462}Y_{7,2}^{(c)}}{168} + \frac{11\sqrt{231}Y_{7,3}^{(s)}}{336} - \frac{\sqrt{21}Y_{7,5}^{(s)}}{16} + \frac{5\sqrt{546}Y_{7,6}^{(c)}}{168} + \frac{\sqrt{39}Y_{7,7}^{(s)}}{48}$$

(1262a)

$$\frac{\sqrt{91}Y_{7,1}^{(s)}}{28} - \frac{5\sqrt{546}Y_{7,2}^{(c)}}{168} + \frac{\sqrt{273}Y_{7,3}^{(s)}}{42} + \frac{\sqrt{462}Y_{7,6}^{(c)}}{168} - \frac{\sqrt{33}Y_{7,7}^{(s)}}{12}$$

(1263a)

8.4.5 $B_{2u} : l = 9$

$$-\frac{3\sqrt{143}Y_{9,0}^{(c)}}{128} - \frac{\sqrt{130}Y_{9,2}^{(c)}}{64} + \frac{3\sqrt{35}Y_{9,4}^{(c)}}{64} - \frac{\sqrt{2}Y_{9,5}^{(s)}}{2} + \frac{5\sqrt{30}Y_{9,6}^{(c)}}{64} - \frac{5\sqrt{85}Y_{9,8}^{(c)}}{128}$$

(1264a)

$$-\frac{15\sqrt{73744385}Y_{9,0}^{(c)}}{776576} + \frac{\sqrt{14748877}Y_{9,1}^{(s)}}{12134} - \frac{25\sqrt{2681614}Y_{9,2}^{(c)}}{388288} - \frac{\sqrt{56313894}Y_{9,3}^{(s)}}{12134} + \frac{75\sqrt{721973}Y_{9,4}^{(c)}}{388288} + \frac{125\sqrt{618834}Y_{9,6}^{(c)}}{388288} - \frac{7\sqrt{206278}Y_{9,7}^{(s)}}{24268} + \frac{\sqrt{6067}Y_{9,8}^{(c)}}{128} + \frac{3\sqrt{12134}Y_{9,9}^{(s)}}{24268}$$

(1265a)

$$\frac{\sqrt{14500130}Y_{9,0}^{(c)}}{6067} + \frac{5121\sqrt{2900026}Y_{9,1}^{(s)}}{23200208} - \frac{39\sqrt{15950143}Y_{9,2}^{(c)}}{1450013} + \frac{43\sqrt{334953003}Y_{9,3}^{(s)}}{5800052} + \frac{9\sqrt{2902926026}Y_{9,4}^{(c)}}{2900026} + \frac{15\sqrt{622055577}Y_{9,6}^{(c)}}{1450013} + \frac{513\sqrt{207351859}Y_{9,7}^{(s)}}{23200208} + \frac{191\sqrt{3524981603}Y_{9,9}^{(s)}}{23200208}$$

(1266a)

$$-\frac{\sqrt{3780502}Y_{9,1}^{(s)}}{3824} - \frac{1077\sqrt{171841}Y_{9,2}^{(c)}}{687364} - \frac{103\sqrt{3608661}Y_{9,3}^{(s)}}{687364} - \frac{8\sqrt{31275062}Y_{9,4}^{(c)}}{171841} - \frac{27\sqrt{6701799}Y_{9,6}^{(c)}}{687364} + \frac{283\sqrt{2233933}Y_{9,7}^{(s)}}{2749456} + \frac{165\sqrt{37976861}Y_{9,9}^{(s)}}{2749456}$$

(1267a)

$$\frac{\sqrt{196287}Y_{9,2}^{(c)}}{2876} - \frac{\sqrt{9347}Y_{9,3}^{(s)}}{719} - \frac{6\sqrt{4314}Y_{9,4}^{(c)}}{719} + \frac{17\sqrt{5033}Y_{9,6}^{(c)}}{2876} + \frac{7\sqrt{15099}Y_{9,7}^{(s)}}{1438} - \frac{\sqrt{256683}Y_{9,9}^{(s)}}{1438}$$

(1268a)

8.4.6 $B_{2u} : l = 11$

$$\frac{\sqrt{92378}Y_{11,0}^{(c)}}{1024} + \frac{9\sqrt{21}Y_{11,10}^{(c)}}{1024} - \frac{\sqrt{9690}Y_{11,2}^{(c)}}{1024} - \frac{3\sqrt{4522}Y_{11,4}^{(c)}}{512} + \frac{61\sqrt{57}Y_{11,6}^{(c)}}{1024} - \frac{39\sqrt{30}Y_{11,8}^{(c)}}{1024} - \frac{\sqrt{2}Y_{11,9}^{(s)}}{2}$$

(1269a)

$$\frac{\sqrt{176358}Y_{11,0}^{(c)}}{1024} - \frac{\sqrt{11}Y_{11,10}^{(c)}}{1024} - \frac{\sqrt{2}Y_{11,11}^{(s)}}{2} - \frac{\sqrt{248710}Y_{11,2}^{(c)}}{1024} + \frac{\sqrt{21318}Y_{11,4}^{(c)}}{512} - \frac{3\sqrt{1463}Y_{11,6}^{(c)}}{1024} + \frac{\sqrt{770}Y_{11,8}^{(c)}}{1024}$$

(1270a)

$$\frac{25\sqrt{2091102}Y_{11,10}^{(c)}}{1104896} - \frac{5\sqrt{3486}Y_{11,1}^{(s)}}{664} + \frac{323\sqrt{113295}Y_{11,2}^{(c)}}{552448} - \frac{11\sqrt{32370}Y_{11,3}^{(c)}}{8632} + \frac{\sqrt{1079}Y_{11,4}^{(c)}}{64} + \frac{\sqrt{7553}Y_{11,5}^{(s)}}{664} + \frac{513\sqrt{770406}Y_{11,6}^{(c)}}{1104896} + \frac{3\sqrt{1926015}Y_{11,7}^{(s)}}{8632} - \frac{\sqrt{36594285}Y_{11,8}^{(c)}}{34528}$$

(1271a)

$$\frac{\sqrt{3382665}Y_{11,0}^{(c)}}{7296} + \frac{337\sqrt{98770}Y_{11,10}^{(c)}}{254976} - \frac{7\sqrt{205010}Y_{11,1}^{(s)}}{37848} + \frac{5291\sqrt{1577}Y_{11,2}^{(c)}}{807424} - \frac{11\sqrt{22078}Y_{11,3}^{(s)}}{37848} - \frac{3\sqrt{23655}Y_{11,5}^{(s)}}{664} - \frac{2801\sqrt{268090}Y_{11,6}^{(c)}}{4844544} + \frac{7\sqrt{26809}Y_{11,7}^{(s)}}{12616} - \frac{277\sqrt{1411}Y_{11,8}^{(c)}}{31872}$$

(1272a)

$$\frac{13\sqrt{53295}Y_{11,0}^{(c)}}{7296} - \frac{185\sqrt{910}Y_{11,10}^{(c)}}{39936} - \frac{7\sqrt{3230}Y_{11,1}^{(s)}}{912} + \frac{717\sqrt{4199}Y_{11,2}^{(c)}}{126464} - \frac{11\sqrt{58786}Y_{11,3}^{(s)}}{11856} + \frac{217\sqrt{2470}Y_{11,5}^{(c)}}{758784} - \frac{8\sqrt{247}Y_{11,7}^{(s)}}{247} + \frac{581\sqrt{13}Y_{11,8}^{(c)}}{4992}$$

(1273a)

$$-\frac{7\sqrt{33}Y_{11,0}^{(c)}}{384} + \frac{7\sqrt{58786}Y_{11,10}^{(c)}}{3072} - \frac{11\sqrt{2}Y_{11,1}^{(s)}}{48} - \frac{7\sqrt{65}Y_{11,2}^{(c)}}{512} + \frac{\sqrt{910}Y_{11,3}^{(s)}}{48} + \frac{25\sqrt{442}Y_{11,6}^{(c)}}{3072} + \frac{\sqrt{20995}Y_{11,8}^{(c)}}{384}$$

(1274a)

8.5 A_{1u}

8.5.1 $A_{1u} : l = 3$

$$\frac{\sqrt{10}Y_{3,1}^{(c)}}{4} + \frac{\sqrt{6}Y_{3,3}^{(c)}}{4}$$

(1275a)

8.5.2 $A_{1u} : l = 5$

$$-\frac{\sqrt{7}Y_{5,1}^{(c)}}{4} + \frac{\sqrt{6}Y_{5,3}^{(c)}}{8} + \frac{\sqrt{30}Y_{5,5}^{(c)}}{8}$$

(1276a)

$$-\frac{\sqrt{3}Y_{5,2}^{(s)}}{2} - \frac{Y_{5,4}^{(s)}}{2}$$

(1277a)

8.5.3 $A_{1u} : l = 7$

$$\frac{\sqrt{138}Y_{7,1}^{(c)}}{16} + \frac{9\sqrt{46}Y_{7,3}^{(c)}}{368} + \frac{5\sqrt{506}Y_{7,5}^{(c)}}{368} + \frac{\sqrt{46046}Y_{7,7}^{(c)}}{368}$$

(1278a)

$$-\frac{\sqrt{22}Y_{7,2}^{(s)}}{8} + \frac{Y_{7,4}^{(s)}}{2} + \frac{\sqrt{26}Y_{7,6}^{(s)}}{8}$$

(1279a)

$$\frac{\sqrt{6578}Y_{7,3}^{(c)}}{92} + \frac{\sqrt{598}Y_{7,5}^{(c)}}{92} - \frac{\sqrt{322}Y_{7,7}^{(c)}}{46}$$

(1280a)

8.5.4 $A_{1u} : l = 9$

$$\frac{11Y_{9,1}^{(c)}}{16} - \frac{\sqrt{462}Y_{9,3}^{(c)}}{176} - \frac{\sqrt{1430}Y_{9,5}^{(c)}}{176} - \frac{7\sqrt{286}Y_{9,7}^{(c)}}{352} - \frac{3\sqrt{4862}Y_{9,9}^{(c)}}{352}$$

(1281a)

$$-\frac{\sqrt{2002}Y_{9,3}^{(c)}}{88} + \frac{3\sqrt{330}Y_{9,5}^{(c)}}{88} + \frac{5\sqrt{66}Y_{9,7}^{(c)}}{88} - \frac{\sqrt{1122}Y_{9,9}^{(c)}}{88}$$

(1282a)

$$-\frac{\sqrt{3315}Y_{9,2}^{(s)}}{120} + \frac{\sqrt{3570}Y_{9,4}^{(s)}}{120} - \frac{\sqrt{85}Y_{9,6}^{(s)}}{40} - \frac{\sqrt{30}Y_{9,8}^{(s)}}{8}$$

(1283a)

$$-\frac{\sqrt{1365}Y_{9,2}^{(s)}}{60} - \frac{2\sqrt{30}Y_{9,4}^{(s)}}{15} - \frac{\sqrt{35}Y_{9,6}^{(s)}}{20}$$

(1284a)

8.5.5 $A_{1u}: l = 11$

$$\frac{\sqrt{2046}Y_{11,11}^{(c)}}{64} + \frac{\sqrt{2733549}Y_{11,1}^{(c)}}{2976} - \frac{\sqrt{150195}Y_{11,3}^{(c)}}{992} + \frac{\sqrt{140182}Y_{11,5}^{(c)}}{1984} - \frac{\sqrt{123690}Y_{11,7}^{(c)}}{5952} + \frac{\sqrt{434}Y_{11,9}^{(c)}}{1984} \tag{1285a}$$

$$-\frac{\sqrt{1938}Y_{11,10}^{(s)}}{64} + \frac{\sqrt{105}Y_{11,2}^{(s)}}{32} - \frac{Y_{11,4}^{(s)}}{2} + \frac{\sqrt{714}Y_{11,6}^{(s)}}{64} \tag{1286a}$$

$$\frac{\sqrt{70}Y_{11,10}^{(s)}}{64} - \frac{\sqrt{323}Y_{11,2}^{(s)}}{32} + \frac{3\sqrt{190}Y_{11,6}^{(s)}}{64} + \frac{Y_{11,8}^{(s)}}{2} \tag{1287a}$$

$$\frac{\sqrt{197067}Y_{11,1}^{(c)}}{121272} + \frac{11\sqrt{530565}Y_{11,3}^{(c)}}{20212} + \frac{\sqrt{10106}Y_{11,5}^{(c)}}{124} - \frac{11\sqrt{2577030}Y_{11,7}^{(c)}}{242544} - \frac{19\sqrt{3264238}Y_{11,9}^{(c)}}{80848} \tag{1288a}$$

$$\frac{\sqrt{360230}Y_{11,1}^{(c)}}{1304} + \frac{\sqrt{38794}Y_{11,3}^{(c)}}{326} + \frac{43\sqrt{163}Y_{11,7}^{(c)}}{1304} + \frac{3\sqrt{46455}Y_{11,9}^{(c)}}{1304} \tag{1289a}$$

8.6 B_{3g}

8.6.1 $B_{3g}: l = 2$

$$\frac{\sqrt{3}Y_{2,0}^{(c)}}{2} + \frac{Y_{2,2}^{(c)}}{2} \tag{1290a}$$

8.6.2 $B_{3g}: l = 4$

$$-\frac{\sqrt{14}Y_{4,1}^{(s)}}{4} - \frac{\sqrt{2}Y_{4,3}^{(s)}}{4} \tag{1291a}$$

$$\frac{\sqrt{5}Y_{4,0}^{(c)}}{4} - \frac{Y_{4,2}^{(c)}}{2} - \frac{\sqrt{7}Y_{4,4}^{(c)}}{4} \tag{1292a}$$

8.6.3 $B_{3g}: l = 6$

$$\frac{\sqrt{3}Y_{6,1}^{(s)}}{4} - \frac{\sqrt{30}Y_{6,3}^{(s)}}{8} - \frac{\sqrt{22}Y_{6,5}^{(s)}}{8} \tag{1293a}$$

$$\frac{\sqrt{42}Y_{6,0}^{(c)}}{8} + \frac{\sqrt{5}Y_{6,2}^{(c)}}{8} + \frac{\sqrt{6}Y_{6,4}^{(c)}}{8} + \frac{\sqrt{11}Y_{6,6}^{(c)}}{8} \tag{1294a}$$

$$\frac{\sqrt{11}Y_{6,2}^{(c)}}{4} - \frac{\sqrt{5}Y_{6,6}^{(c)}}{4} \tag{1295a}$$

8.6.4 $B_{3g}: l = 8$

$$-\frac{\sqrt{858}Y_{8,0}^{(c)}}{64} + \frac{\sqrt{546}Y_{8,4}^{(c)}}{32} + \frac{Y_{8,6}^{(c)}}{2} + \frac{\sqrt{30}Y_{8,8}^{(c)}}{64} \tag{1296a}$$

$$-\frac{3\sqrt{70}Y_{8,0}^{(c)}}{64} + \frac{Y_{8,2}^{(c)}}{2} - \frac{\sqrt{110}Y_{8,4}^{(c)}}{32} + \frac{\sqrt{2002}Y_{8,8}^{(c)}}{64} \tag{1297a}$$

$$-\frac{\sqrt{38038}Y_{8,1}^{(s)}}{304} + \frac{\sqrt{7410}Y_{8,3}^{(s)}}{304} - \frac{\sqrt{38}Y_{8,5}^{(s)}}{16} - \frac{5\sqrt{1330}Y_{8,7}^{(s)}}{304} \tag{1298a}$$

$$\frac{\sqrt{2090}Y_{8,1}^{(s)}}{76} + \frac{\sqrt{798}Y_{8,3}^{(s)}}{38} - \frac{\sqrt{494}Y_{8,7}^{(s)}}{76} \tag{1299a}$$

8.6.5 $B_{3g}: l = 10$

$$\frac{3\sqrt{741}Y_{10,1}^{(s)}}{304} + \frac{\sqrt{38}Y_{10,3}^{(s)}}{304} - \frac{\sqrt{190}Y_{10,5}^{(s)}}{16} - \frac{7\sqrt{646}Y_{10,7}^{(s)}}{608} + \frac{\sqrt{102}Y_{10,9}^{(s)}}{32} \tag{1300a}$$

$$\frac{\sqrt{4789070}Y_{10,0}^{(c)}}{6304} + \frac{\sqrt{18715}Y_{10,10}^{(c)}}{6304} - \frac{\sqrt{261222}Y_{10,2}^{(c)}}{6304} - \frac{11\sqrt{20094}Y_{10,4}^{(c)}}{3152} + \frac{31\sqrt{10047}Y_{10,6}^{(c)}}{6304} + \frac{\sqrt{394}Y_{10,8}^{(c)}}{32} \tag{1301a}$$

$$\frac{25\sqrt{132208670}Y_{10,0}^{(c)}}{1201897} - \frac{49\sqrt{25233827515}Y_{10,10}^{(c)}}{19230352} + \frac{\sqrt{7211382}Y_{10,2}^{(c)}}{3152} + \frac{125\sqrt{93747966}Y_{10,4}^{(c)}}{7211382} + \frac{1331\sqrt{46873983}Y_{10,6}^{(c)}}{57691056} \tag{1302a}$$

$$-\frac{\sqrt{4199}Y_{10,1}^{(s)}}{152} + \frac{\sqrt{1938}Y_{10,3}^{(s)}}{76} + \frac{9\sqrt{114}Y_{10,7}^{(s)}}{304} + \frac{7\sqrt{2}Y_{10,9}^{(s)}}{16} \tag{1303a}$$

$$\frac{\sqrt{16576417}Y_{10,0}^{(c)}}{6101} + \frac{31\sqrt{207434}Y_{10,10}^{(c)}}{24404} + \frac{13\sqrt{1738785}Y_{10,4}^{(c)}}{36606} - \frac{\sqrt{3477570}Y_{10,6}^{(c)}}{73212} \tag{1304a}$$

8.6.6 $B_{3g}: l = 12$

$$-\frac{\sqrt{5231954}Y_{12,0}^{(c)}}{5696} + \frac{\sqrt{267}Y_{12,10}^{(c)}}{2848} + \frac{\sqrt{2047}Y_{12,12}^{(c)}}{64} + \frac{\sqrt{1897302}Y_{12,2}^{(c)}}{2848} - \frac{3\sqrt{316217}Y_{12,4}^{(c)}}{5696} + \frac{\sqrt{130207}Y_{12,6}^{(c)}}{2848} - \frac{\sqrt{41118}Y_{12,8}^{(c)}}{5696} \tag{1305a}$$

$$-\frac{5\sqrt{21948762}Y_{12,11}^{(s)}}{48704} - \frac{5\sqrt{2988447}Y_{12,1}^{(s)}}{24352} - \frac{27\sqrt{12937}Y_{12,3}^{(s)}}{24352} - \frac{\sqrt{1522}Y_{12,5}^{(s)}}{64} + \frac{27\sqrt{607278}Y_{12,7}^{(s)}}{48704} + \frac{75\sqrt{28918}Y_{12,9}^{(s)}}{48704} \tag{1306a}$$

$$-\frac{147\sqrt{228204114}Y_{12,11}^{(s)}}{6614612} - \frac{71\sqrt{11216728299}Y_{12,1}^{(s)}}{13229224} + \frac{31\sqrt{5875429109}Y_{12,3}^{(s)}}{6614612} - \frac{417\sqrt{763987686}Y_{12,7}^{(s)}}{26458448} - \frac{\sqrt{36380366}Y_{12,9}^{(s)}}{12176} \tag{1307a}$$

$$-\frac{13\sqrt{60836217}Y_{12,0}^{(c)}}{734072} - \frac{223\sqrt{24407894}Y_{12,10}^{(c)}}{2936288} - \frac{327\sqrt{120112531}Y_{12,2}^{(c)}}{16149584} + \frac{13\sqrt{720675186}Y_{12,4}^{(c)}}{2018698} + \frac{\sqrt{6056094}Y_{12,6}^{(c)}}{2848} + \frac{221\sqrt{19177631}Y_{12,8}^{(c)}}{8074792} \tag{1308a}$$

$$\frac{5\sqrt{562926}Y_{12,0}^{(c)}}{8248} - \frac{\sqrt{333013}Y_{12,10}^{(c)}}{1031} + \frac{\sqrt{22682}Y_{12,2}^{(c)}}{22682} - \frac{35\sqrt{34023}Y_{12,4}^{(c)}}{11341} - \frac{5\sqrt{51284002}Y_{12,8}^{(c)}}{90728} \tag{1309a}$$

$$\frac{\sqrt{2844457}Y_{12,11}^{(s)}}{4346} - \frac{\sqrt{20891222}Y_{12,1}^{(s)}}{8692} - \frac{\sqrt{39883242}Y_{12,3}^{(s)}}{8692} - \frac{\sqrt{849643}Y_{12,7}^{(s)}}{4346} \tag{1310a}$$

8.7 B_{1g}

8.7.1 $B_{1g} : l = 2$

$$\frac{\sqrt{2}Y_{2,1}^{(c)}}{2} + \frac{\sqrt{2}Y_{2,2}^{(s)}}{2} \tag{1311a}$$

8.7.2 $B_{1g} : l = 4$

$$\frac{\sqrt{2}Y_{4,1}^{(c)}}{2} - \frac{Y_{4,2}^{(s)}}{4} - \frac{\sqrt{7}Y_{4,4}^{(s)}}{4} \tag{1312a}$$

$$\frac{\sqrt{7}Y_{4,2}^{(s)}}{4} - \frac{\sqrt{2}Y_{4,3}^{(c)}}{2} - \frac{Y_{4,4}^{(s)}}{4} \tag{1313a}$$

8.7.3 $B_{1g} : l = 6$

$$\frac{\sqrt{2}Y_{6,1}^{(c)}}{2} + \frac{\sqrt{5}Y_{6,2}^{(s)}}{16} + \frac{\sqrt{6}Y_{6,4}^{(s)}}{8} + \frac{3\sqrt{11}Y_{6,6}^{(s)}}{16} \tag{1314a}$$

$$\frac{9\sqrt{2}Y_{6,2}^{(s)}}{32} + \frac{\sqrt{2}Y_{6,3}^{(c)}}{2} + \frac{\sqrt{15}Y_{6,4}^{(s)}}{8} - \frac{\sqrt{110}Y_{6,6}^{(s)}}{32} \tag{1315a}$$

$$\frac{\sqrt{330}Y_{6,2}^{(s)}}{32} - \frac{\sqrt{11}Y_{6,4}^{(s)}}{8} + \frac{\sqrt{2}Y_{6,5}^{(c)}}{2} + \frac{\sqrt{6}Y_{6,6}^{(s)}}{32} \tag{1316a}$$

8.7.4 $B_{1g} : l = 8$

$$-\frac{3\sqrt{33}Y_{8,2}^{(s)}}{64} + \frac{\sqrt{2}Y_{8,3}^{(s)}}{2} - \frac{5\sqrt{30}Y_{8,4}^{(s)}}{64} - \frac{\sqrt{455}Y_{8,6}^{(s)}}{64} + \frac{\sqrt{546}Y_{8,8}^{(s)}}{64} \tag{1317a}$$

$$\frac{\sqrt{16874}Y_{8,1}^{(c)}}{354} + \frac{\sqrt{295295}Y_{8,2}^{(s)}}{3776} + \frac{25\sqrt{10738}Y_{8,4}^{(s)}}{11328} - \frac{7\sqrt{826}Y_{8,5}^{(c)}}{354} - \frac{3\sqrt{177}Y_{8,6}^{(s)}}{64} + \frac{\sqrt{590}Y_{8,7}^{(c)}}{118} - \frac{91\sqrt{590}Y_{8,8}^{(s)}}{11328} \tag{1318a}$$

$$\frac{55\sqrt{29445130}Y_{8,1}^{(c)}}{494184} - \frac{\sqrt{2061159}Y_{8,2}^{(s)}}{20591} - \frac{5\sqrt{18737810}Y_{8,4}^{(s)}}{61773} + \frac{73\sqrt{1441370}Y_{8,5}^{(c)}}{247092} - \frac{79\sqrt{41182}Y_{8,7}^{(c)}}{164728} - \frac{\sqrt{41182}Y_{8,8}^{(s)}}{354} \tag{1319a}$$

$$-\frac{\sqrt{4886}Y_{8,1}^{(c)}}{2792} - \frac{5\sqrt{1745}Y_{8,2}^{(s)}}{349} + \frac{3\sqrt{7678}Y_{8,4}^{(s)}}{698} + \frac{\sqrt{99814}Y_{8,5}^{(c)}}{1396} + \frac{\sqrt{3493490}Y_{8,7}^{(c)}}{2792} \tag{1320a}$$

8.7.5 $B_{1g} : l = 10$

$$-\frac{9\sqrt{39}Y_{10,1}^{(c)}}{256} - \frac{69\sqrt{2}Y_{10,3}^{(c)}}{256} + \frac{\sqrt{10}Y_{10,5}^{(c)}}{256} - \frac{\sqrt{2}Y_{10,6}^{(s)}}{2} + \frac{43\sqrt{34}Y_{10,7}^{(c)}}{512} - \frac{3\sqrt{1938}Y_{10,9}^{(c)}}{512} \tag{1321a}$$

$$\frac{\sqrt{1243281910}Y_{10,10}^{(s)}}{59218} + \frac{\sqrt{29609}Y_{10,1}^{(c)}}{256} + \frac{7\sqrt{88827}Y_{10,2}^{(s)}}{29609} - \frac{621\sqrt{2309502}Y_{10,3}^{(c)}}{7579904} + \frac{4\sqrt{1154751}Y_{10,4}^{(s)}}{29609} + \frac{9\sqrt{11547510}Y_{10,5}^{(c)}}{7579904} + \frac{387\sqrt{39261534}Y_{10,7}^{(c)}}{15159808} + \frac{4\sqrt{6543589}Y_{10,8}^{(s)}}{29609} - \frac{81\sqrt{248656382}Y_{10,9}^{(c)}}{15159808} \tag{1322a}$$

$$\frac{907\sqrt{1698456980958}Y_{10,10}^{(s)}}{7011174328} + \frac{9241\sqrt{56965791415}Y_{10,2}^{(s)}}{7011174328} + \frac{69\sqrt{8763967910}Y_{10,3}^{(c)}}{876396791} + \frac{73847\sqrt{4381983955}Y_{10,4}^{(s)}}{14022348656} + \frac{\sqrt{1752793582}Y_{10,5}^{(c)}}{59218} - \frac{43\sqrt{148987454470}Y_{10,7}^{(c)}}{1752793582} - \frac{14863\sqrt{223481181705}Y_{10,8}^{(s)}}{14022348656} + \frac{3\sqrt{8492284904790}Y_{10,9}^{(c)}}{1752793582} \tag{1323a}$$

$$\frac{33337\sqrt{5518312948210}Y_{10,10}^{(s)}}{232350018872} - \frac{19611\sqrt{19256007814017}Y_{10,2}^{(s)}}{232350018872} - \frac{19181\sqrt{2962462740618}Y_{10,3}^{(c)}}{58087504718} - \frac{132117\sqrt{1481231370309}Y_{10,4}^{(s)}}{464700037744} - \frac{29094\sqrt{174262514154}Y_{10,7}^{(c)}}{29043752359} - \frac{\sqrt{29043752359}Y_{10,8}^{(s)}}{473584} + \frac{1271\sqrt{1103662589642}Y_{10,9}^{(c)}}{29043752359} \tag{1324a}$$

$$-\frac{15\sqrt{14718615}Y_{10,10}^{(s)}}{981241} - \frac{11\sqrt{8240461918}Y_{10,2}^{(s)}}{1962482} + \frac{7\sqrt{316940843}Y_{10,3}^{(c)}}{981241} + \frac{19\sqrt{633881686}Y_{10,4}^{(s)}}{981241} - \frac{111\sqrt{18643579}Y_{10,7}^{(c)}}{1962482} - \frac{745\sqrt{2943723}Y_{10,9}^{(c)}}{1962482} \tag{1325a}$$

8.7.6 $B_{1g} : l = 12$

$$\frac{\sqrt{100947}Y_{12,11}^{(c)}}{1024} + \frac{5\sqrt{1122}Y_{12,1}^{(c)}}{1024} + \frac{23\sqrt{238}Y_{12,3}^{(c)}}{1024} + \frac{75\sqrt{7}Y_{12,5}^{(c)}}{1024} - \frac{\sqrt{2}Y_{12,6}^{(s)}}{2} - \frac{29\sqrt{57}Y_{12,7}^{(c)}}{1024} - \frac{37\sqrt{133}Y_{12,9}^{(c)}}{1024} \tag{1326a}$$

$$-\frac{\sqrt{3542}Y_{12,11}^{(c)}}{512} + \frac{\sqrt{3553}Y_{12,1}^{(c)}}{256} + \frac{\sqrt{6783}Y_{12,3}^{(c)}}{256} - \frac{3\sqrt{798}Y_{12,5}^{(c)}}{512} - \frac{139\sqrt{2}Y_{12,7}^{(c)}}{512} - \frac{\sqrt{2}Y_{12,8}^{(s)}}{2} + \frac{31\sqrt{42}Y_{12,9}^{(c)}}{512} \tag{1327a}$$

$$-\frac{\sqrt{2}Y_{12,10}^{(s)}}{2} + \frac{5\sqrt{23}Y_{12,11}^{(c)}}{1024} + \frac{5\sqrt{4522}Y_{12,1}^{(c)}}{1024} + \frac{\sqrt{21318}Y_{12,3}^{(c)}}{1024} - \frac{19\sqrt{627}Y_{12,5}^{(c)}}{1024} + \frac{43\sqrt{77}Y_{12,7}^{(c)}}{1024} - \frac{25\sqrt{33}Y_{12,9}^{(c)}}{1024} \tag{1328a}$$

$$-\frac{\sqrt{245157}Y_{12,11}^{(c)}}{1024} + \frac{5\sqrt{462}Y_{12,1}^{(c)}}{1024} + \frac{201\sqrt{2}Y_{12,3}^{(c)}}{1024} - \frac{\sqrt{2}Y_{12,4}^{(s)}}{2} + \frac{85\sqrt{17}Y_{12,5}^{(c)}}{1024} + \frac{3\sqrt{6783}Y_{12,7}^{(c)}}{1024} - \frac{3\sqrt{323}Y_{12,9}^{(c)}}{1024} \tag{1329a}$$

$$-\frac{\sqrt{3}Y_{12,11}^{(c)}}{1024} - \frac{\sqrt{2}Y_{12,12}^{(c)}}{2} + \frac{\sqrt{312018}Y_{12,1}^{(c)}}{1024} - \frac{\sqrt{163438}Y_{12,3}^{(c)}}{1024} + \frac{3\sqrt{4807}Y_{12,5}^{(c)}}{1024} - \frac{\sqrt{5313}Y_{12,7}^{(c)}}{1024} + \frac{\sqrt{253}Y_{12,9}^{(c)}}{1024} \tag{1330a}$$

$$\frac{\sqrt{163438}Y_{12,11}^{(c)}}{1024} + \frac{3\sqrt{77}Y_{12,1}^{(c)}}{512} - \frac{\sqrt{2}Y_{12,2}^{(s)}}{2} + \frac{45\sqrt{3}Y_{12,3}^{(c)}}{512} + \frac{25\sqrt{102}Y_{12,5}^{(c)}}{1024} + \frac{5\sqrt{4522}Y_{12,7}^{(c)}}{1024} + \frac{9\sqrt{1938}Y_{12,9}^{(c)}}{1024} \tag{1331a}$$

8.8 B_{2g}

8.8.1 $B_{2g} : l = 2$

$$\frac{\sqrt{2}Y_{2,1}^{(c)}}{2} - \frac{\sqrt{2}Y_{2,2}^{(s)}}{2} \tag{1332a}$$

8.8.2 $B_{2g} : l = 4$

$$\frac{\sqrt{2}Y_{4,1}^{(c)}}{2} + \frac{Y_{4,2}^{(s)}}{4} + \frac{\sqrt{7}Y_{4,4}^{(s)}}{4} \tag{1333a}$$

$$\frac{\sqrt{7}Y_{4,2}^{(s)}}{4} + \frac{\sqrt{2}Y_{4,3}^{(c)}}{2} - \frac{Y_{4,4}^{(s)}}{4} \tag{1334a}$$

8.8.3 $B_{2g}: l = 6$

$$\frac{3\sqrt{11}Y_{6,1}^{(c)}}{16} - \frac{\sqrt{110}Y_{6,3}^{(c)}}{32} + \frac{\sqrt{6}Y_{6,5}^{(c)}}{32} - \frac{\sqrt{2}Y_{6,6}^{(s)}}{2} \tag{1335a}$$

$$-\frac{3\sqrt{69}Y_{6,1}^{(c)}}{368} - \frac{\sqrt{690}Y_{6,2}^{(s)}}{46} + \frac{\sqrt{690}Y_{6,3}^{(c)}}{736} + \frac{2\sqrt{23}Y_{6,4}^{(s)}}{23} + \frac{\sqrt{506}Y_{6,5}^{(c)}}{32} \tag{1336a}$$

$$\frac{\sqrt{230}Y_{6,1}^{(c)}}{46} - \frac{2\sqrt{23}Y_{6,2}^{(s)}}{23} + \frac{3\sqrt{23}Y_{6,3}^{(c)}}{23} - \frac{\sqrt{690}Y_{6,4}^{(s)}}{46} \tag{1337a}$$

8.8.4 $B_{2g}: l = 8$

$$-\frac{\sqrt{1430}Y_{8,1}^{(c)}}{64} + \frac{\sqrt{546}Y_{8,3}^{(c)}}{64} - \frac{\sqrt{70}Y_{8,5}^{(c)}}{64} + \frac{\sqrt{2}Y_{8,7}^{(c)}}{64} - \frac{\sqrt{2}Y_{8,8}^{(s)}}{2} \tag{1338a}$$

$$-\frac{5\sqrt{1979978}Y_{8,1}^{(c)}}{63296} + \frac{\sqrt{707135}Y_{8,2}^{(s)}}{1978} + \frac{7\sqrt{385710}Y_{8,3}^{(c)}}{63296} + \frac{3\sqrt{25714}Y_{8,4}^{(s)}}{1978} + \frac{\sqrt{1978}Y_{8,5}^{(c)}}{64} - \frac{7\sqrt{20769}Y_{8,6}^{(s)}}{1978} + \frac{\sqrt{69230}Y_{8,7}^{(c)}}{63296} \tag{1339a}$$

$$\frac{\sqrt{2067010}Y_{8,1}^{(c)}}{75164} + \frac{123\sqrt{1446907}Y_{8,2}^{(s)}}{300656} - \frac{\sqrt{789222}Y_{8,3}^{(c)}}{75164} - \frac{31\sqrt{1315370}Y_{8,4}^{(s)}}{75164} + \frac{29\sqrt{3664245}Y_{8,6}^{(s)}}{300656} + \frac{\sqrt{488566}Y_{8,7}^{(c)}}{989} \tag{1340a}$$

$$-\frac{\sqrt{798}Y_{8,1}^{(c)}}{76} - \frac{5\sqrt{285}Y_{8,2}^{(s)}}{304} - \frac{\sqrt{2090}Y_{8,3}^{(c)}}{76} - \frac{\sqrt{1254}Y_{8,4}^{(s)}}{76} - \frac{\sqrt{19019}Y_{8,6}^{(s)}}{304} \tag{1341a}$$

8.8.5 $B_{2g}: l = 10$

$$\frac{\sqrt{9690}Y_{10,10}^{(s)}}{256} - \frac{7\sqrt{13}Y_{10,2}^{(s)}}{128} + \frac{\sqrt{2}Y_{10,3}^{(c)}}{2} - \frac{11Y_{10,4}^{(s)}}{32} - \frac{69\sqrt{2}Y_{10,6}^{(s)}}{256} - \frac{\sqrt{51}Y_{10,8}^{(s)}}{32} \tag{1342a}$$

$$-\frac{\sqrt{10}Y_{10,10}^{(s)}}{512} - \frac{\sqrt{12597}Y_{10,2}^{(s)}}{256} + \frac{\sqrt{969}Y_{10,4}^{(s)}}{64} - \frac{3\sqrt{1938}Y_{10,6}^{(s)}}{512} + \frac{\sqrt{19}Y_{10,8}^{(s)}}{64} + \frac{\sqrt{2}Y_{10,9}^{(c)}}{2} \tag{1343a}$$

$$-\frac{45\sqrt{798}Y_{10,10}^{(s)}}{3584} + \frac{\sqrt{23205}Y_{10,1}^{(c)}}{595} - \frac{661\sqrt{7735}Y_{10,2}^{(s)}}{152320} - \frac{\sqrt{595}Y_{10,4}^{(s)}}{64} + \frac{5\sqrt{238}Y_{10,5}^{(c)}}{119} + \frac{129\sqrt{1190}Y_{10,6}^{(s)}}{304640} + \frac{\sqrt{70}Y_{10,7}^{(c)}}{70} + \frac{9\sqrt{105}Y_{10,8}^{(s)}}{320} \tag{1344a}$$

$$-\frac{10515\sqrt{1120048062}Y_{10,10}^{(s)}}{1257597824} + \frac{1371\sqrt{32569818645}Y_{10,1}^{(c)}}{835123555} + \frac{174621\sqrt{10856606215}Y_{10,2}^{(s)}}{53447907520} + \frac{25\sqrt{334049422}Y_{10,5}^{(c)}}{334049422} - \frac{\sqrt{1670247110}Y_{10,6}^{(s)}}{76160} - \frac{3182\sqrt{98249830}Y_{10,7}^{(c)}}{49124915} + \frac{309\sqrt{147374745}Y_{10,8}^{(s)}}{28071380} \tag{1345a}$$

$$\frac{29\sqrt{346681543}Y_{10,10}^{(s)}}{1403569} - \frac{107\sqrt{238606730}Y_{10,1}^{(c)}}{2807138} + \frac{9\sqrt{715820190}Y_{10,2}^{(s)}}{2807138} + \frac{13\sqrt{930566247}Y_{10,5}^{(c)}}{1403569} - \frac{23\sqrt{273695955}Y_{10,7}^{(c)}}{1403569} + \frac{61\sqrt{182463970}Y_{10,8}^{(s)}}{1403569} \tag{1346a}$$

8.8.6 $B_{2g}: l = 12$

$$\frac{\sqrt{245157}Y_{12,11}^{(c)}}{1024} - \frac{5\sqrt{462}Y_{12,1}^{(c)}}{1024} - \frac{201\sqrt{2}Y_{12,3}^{(c)}}{1024} - \frac{\sqrt{2}Y_{12,4}^{(s)}}{2} - \frac{85\sqrt{17}Y_{12,5}^{(s)}}{1024} - \frac{3\sqrt{6783}Y_{12,7}^{(c)}}{1024} + \frac{3\sqrt{323}Y_{12,9}^{(c)}}{1024} \tag{1347a}$$

$$\frac{5\sqrt{1159300618}Y_{12,10}^{(s)}}{512738} + \frac{165\sqrt{13331957107}Y_{12,11}^{(c)}}{262521856} + \frac{\sqrt{79991742642}Y_{12,12}^{(s)}}{512738} + \frac{\sqrt{512738}Y_{12,1}^{(c)}}{1024} + \frac{3\sqrt{19740413}Y_{12,2}^{(s)}}{256369} - \frac{1005\sqrt{118442478}Y_{12,3}^{(c)}}{262521856}$$
$$- \frac{425\sqrt{1006761063}Y_{12,5}^{(c)}}{262521856} + \frac{5\sqrt{287646018}Y_{12,6}^{(s)}}{512738} - \frac{315\sqrt{910879057}Y_{12,7}^{(c)}}{262521856} + \frac{2\sqrt{910879057}Y_{12,8}^{(s)}}{256369} + \frac{15\sqrt{19128460197}Y_{12,9}^{(c)}}{262521856} \tag{1348a}$$

$$-\frac{72935\sqrt{3155575775894}Y_{12,10}^{(s)}}{8780732593792} + \frac{\sqrt{68599473389}Y_{12,11}^{(c)}}{512738} - \frac{34519\sqrt{411596840334}Y_{12,12}^{(s)}}{274397893556} + \frac{31613\sqrt{5605880365875691}Y_{12,2}^{(s)}}{4390366296896} + \frac{201\sqrt{33635282195254146}Y_{12,3}^{(c)}}{137198946778}$$
$$+ \frac{1445\sqrt{9892730057742769}Y_{12,5}^{(c)}}{137198946778} + \frac{30293\sqrt{13849822080398766}Y_{12,6}^{(s)}}{8780732593792} + \frac{2907\sqrt{121489667371919}Y_{12,7}^{(c)}}{137198946778} - \frac{9677\sqrt{121489667371919}Y_{12,8}^{(s)}}{548795787112} - \frac{969\sqrt{52067000302251}Y_{12,9}^{(c)}}{137198946778} \tag{1349a}$$

$$\frac{1618715\sqrt{1584790469723801802}Y_{12,10}^{(s)}}{23109270918733952} + \frac{21831\sqrt{1215006026788240482}Y_{12,12}^{(s)}}{722164716210436} + \frac{18661687\sqrt{64453200921781413}Y_{12,2}^{(s)}}{11554635459366976} - \frac{224212\sqrt{4296880061452094}Y_{12,3}^{(c)}}{180541179052609}$$
$$- \frac{100905\sqrt{1263788253368263}Y_{12,5}^{(c)}}{180541179052609} - \frac{\sqrt{361082358105218}Y_{12,6}^{(s)}}{34250368} + \frac{1539887\sqrt{10290847205998713}Y_{12,7}^{(c)}}{361082358105218} - \frac{1025739\sqrt{10290847205998713}Y_{12,8}^{(s)}}{1444329432420872} + \frac{1156147\sqrt{24011976813996997}Y_{12,9}^{(c)}}{361082358105218} \tag{1350a}$$

$$-\frac{\sqrt{17379537331759892}3Y_{12,10}^{(s)}}{674715989} + \frac{1429800\sqrt{1199188075891432568}7Y_{12,12}^{(s)}}{15799579392508993} + \frac{727795\sqrt{10206528287560809478}Y_{12,2}^{(s)}}{31599158785017986} - \frac{3694269\sqrt{15309792431341214217}Y_{12,3}^{(c)}}{63198317570035972}$$
$$+ \frac{23232393\sqrt{1801152050746025202}Y_{12,5}^{(c)}}{63198317570035972} - \frac{103466867\sqrt{22119411149512590}2Y_{12,7}^{(c)}}{126396635140071944} + \frac{4060900\sqrt{22119411149512590}2Y_{12,8}^{(s)}}{15799579392508993} + \frac{97202155\sqrt{94797476355053958}Y_{12,9}^{(c)}}{126396635140071944} \tag{1351a}$$

$$-\frac{86\sqrt{5924409161}Y_{12,12}^{(s)}}{23416637} + \frac{20\sqrt{45381442506}Y_{12,2}^{(s)}}{23416637} + \frac{517\sqrt{7563573751}Y_{12,3}^{(c)}}{93666548} - \frac{513\sqrt{889832206}Y_{12,5}^{(c)}}{93666548} - \frac{1343\sqrt{983498754}Y_{12,7}^{(c)}}{187333096} + \frac{929\sqrt{983498754}Y_{12,8}^{(s)}}{46833274} + \frac{12005\sqrt{46833274}Y_{12,9}^{(c)}}{187333096} \tag{1352a}$$

9 Group C_4

9.1 A

9.1.1 $A : l = 0$

$$Y_{0,0}^{(c)} \tag{1353a}$$

9.1.2 $A : l = 1$

$$Y_{1,0}^{(c)} \tag{1354a}$$

9.1.3 $A : l = 2$

$$Y_{2,0}^{(c)} \tag{1355a}$$

9.1.4 $A : l = 3$

$$Y_{3,0}^{(c)} \tag{1356a}$$

9.1.5 $A : l = 4$

$$-Y_{4,4}^{(s)} \tag{1357a}$$

$$Y_{4,0}^{(c)} \tag{1358a}$$

$$Y_{4,4}^{(c)} \tag{1359a}$$

9.1.6 $A : l = 5$

$$Y_{5,4}^{(c)} \tag{1360a}$$

$$-Y_{5,4}^{(s)} \tag{1361a}$$

$$Y_{5,0}^{(c)} \tag{1362a}$$

9.1.7 $A : l = 6$

$$-Y_{6,4}^{(s)} \tag{1363a}$$

$$Y_{6,4}^{(c)} \tag{1364a}$$

$$Y_{6,0}^{(c)} \tag{1365a}$$

9.1.8 $A : l = 7$

$$Y_{7,0}^{(c)} \tag{1366a}$$

$$Y_{7,4}^{(c)} \tag{1367a}$$

$$-Y_{7,4}^{(s)} \tag{1368a}$$

9.1.9 $A : l = 8$

$$Y_{8,8}^{(c)} \tag{1369a}$$

$$Y_{8,0}^{(c)} \tag{1370a}$$

$$Y_{8,4}^{(c)} \tag{1371a}$$

$$-Y_{8,8}^{(s)} \tag{1372a}$$

$$-Y_{8,4}^{(s)} \tag{1373a}$$

9.1.10 $A : l = 9$

$$Y_{9,8}^{(c)} \tag{1374a}$$

$$Y_{9,0}^{(c)} \tag{1375a}$$

$$Y_{9,4}^{(c)} \tag{1376a}$$

$$-Y_{9,4}^{(s)} \tag{1377a}$$

$$-Y_{9,8}^{(s)} \tag{1378a}$$

9.1.11 $A : l = 10$

$$-Y_{10,8}^{(s)} \tag{1379a}$$

$$-Y_{10,4}^{(s)} \tag{1380a}$$

$$Y_{10,0}^{(c)} \tag{1381a}$$

$$Y_{10,8}^{(c)} \tag{1382a}$$

$$Y_{10,4}^{(c)} \tag{1383a}$$

9.1.12 $A : l = 11$

$$-Y_{11,4}^{(s)} \tag{1384a}$$

$$-Y_{11,8}^{(s)} \tag{1385a}$$

$$Y_{11,0}^{(c)} \tag{1386a}$$

$$Y_{11,8}^{(c)} \tag{1387a}$$

$$Y_{11,4}^{(c)} \tag{1388a}$$

9.1.13 $A : l = 12$

$$-Y_{12,4}^{(s)} \tag{1389a}$$

$$Y_{12,4}^{(c)} \tag{1390a}$$

$$-Y_{12,12}^{(s)} \tag{1391a}$$

$$Y_{12,8}^{(c)} \tag{1392a}$$

$$-Y_{12,8}^{(s)} \tag{1393a}$$

$$Y_{12,0}^{(c)} \tag{1394a}$$

$$Y_{12,12}^{(c)} \tag{1395a}$$

9.2 E^1

9.2.1 $E^1 : l = 1$

$$\frac{\sqrt{2}iY_{1,1}^{(c)}}{2} - \frac{\sqrt{2}Y_{1,1}^{(s)}}{2} \tag{1396a}$$

9.2.2 $E^1 : l = 2$

$$\frac{\sqrt{2}Y_{2,1}^{(c)}}{2} + \frac{\sqrt{2}iY_{2,1}^{(s)}}{2} \tag{1397a}$$

9.2.3 $E^1 : l = 3$

$$\frac{\sqrt{2}iY_{3,1}^{(c)}}{2} - \frac{\sqrt{2}Y_{3,1}^{(s)}}{2} \tag{1398a}$$

$$\frac{\sqrt{2}Y_{3,3}^{(c)}}{2} - \frac{\sqrt{2}iY_{3,3}^{(s)}}{2} \tag{1399a}$$

9.2.4 $E^1 : l = 4$

$$\frac{\sqrt{2}Y_{4,3}^{(c)}}{2} - \frac{\sqrt{2}iY_{4,3}^{(s)}}{2} \tag{1400a}$$

$$\frac{\sqrt{2}iY_{4,1}^{(c)}}{2} - \frac{\sqrt{2}Y_{4,1}^{(s)}}{2} \tag{1401a}$$

9.2.5 $E^1 : l = 5$

$$\frac{\sqrt{2}iY_{5,5}^{(c)}}{2} - \frac{\sqrt{2}Y_{5,5}^{(s)}}{2} \tag{1402a}$$

$$\frac{\sqrt{2}iY_{5,1}^{(c)}}{2} - \frac{\sqrt{2}Y_{5,1}^{(s)}}{2} \tag{1403a}$$

$$-\frac{\sqrt{2}iY_{5,3}^{(c)}}{2} - \frac{\sqrt{2}Y_{5,3}^{(s)}}{2} \tag{1404a}$$

9.2.6 $E^1 : l = 6$

$$\frac{\sqrt{2}iY_{6,5}^{(c)}}{2} - \frac{\sqrt{2}Y_{6,5}^{(s)}}{2} \tag{1405a}$$

$$-\frac{\sqrt{2}iY_{6,3}^{(c)}}{2} - \frac{\sqrt{2}Y_{6,3}^{(s)}}{2} \tag{1406a}$$

$$\frac{\sqrt{2}iY_{6,1}^{(c)}}{2} - \frac{\sqrt{2}Y_{6,1}^{(s)}}{2} \tag{1407a}$$

9.2.7 $E^1 : l = 7$

$$\frac{\sqrt{2}Y_{7,7}^{(c)}}{2} - \frac{\sqrt{2}iY_{7,7}^{(s)}}{2} \tag{1408a}$$

$$\frac{\sqrt{2}Y_{7,3}^{(c)}}{2} - \frac{\sqrt{2}iY_{7,3}^{(s)}}{2} \tag{1409a}$$

$$\frac{\sqrt{2}iY_{7,1}^{(c)}}{2} - \frac{\sqrt{2}Y_{7,1}^{(s)}}{2} \tag{1410a}$$

$$\frac{\sqrt{2}Y_{7,5}^{(c)}}{2} + \frac{\sqrt{2}iY_{7,5}^{(s)}}{2} \tag{1411a}$$

9.2.8 $E^1 : l = 8$

$$\frac{\sqrt{2}Y_{8,5}^{(c)}}{2} + \frac{\sqrt{2}iY_{8,5}^{(s)}}{2} \tag{1412a}$$

$$\frac{\sqrt{2}Y_{8,1}^{(c)}}{2} + \frac{\sqrt{2}iY_{8,1}^{(s)}}{2} \tag{1413a}$$

$$\frac{\sqrt{2}Y_{8,7}^{(c)}}{2} - \frac{\sqrt{2}iY_{8,7}^{(s)}}{2} \tag{1414a}$$

$$-\frac{\sqrt{2}iY_{8,3}^{(c)}}{2} - \frac{\sqrt{2}Y_{8,3}^{(s)}}{2} \tag{1415a}$$

9.2.9 $E^1 : l = 9$

$$\frac{\sqrt{2}Y_{9,9}^{(c)}}{2} + \frac{\sqrt{2}iY_{9,9}^{(s)}}{2} \tag{1416a}$$

$$\frac{\sqrt{2}iY_{9,5}^{(c)}}{2} - \frac{\sqrt{2}Y_{9,5}^{(s)}}{2} \tag{1417a}$$

$$\frac{\sqrt{2}Y_{9,1}^{(c)}}{2} + \frac{\sqrt{2}iY_{9,1}^{(s)}}{2} \tag{1418a}$$

$$\frac{\sqrt{2}Y_{9,7}^{(c)}}{2} - \frac{\sqrt{2}iY_{9,7}^{(s)}}{2} \tag{1419a}$$

$$-\frac{\sqrt{2}iY_{9,3}^{(c)}}{2} - \frac{\sqrt{2}Y_{9,3}^{(s)}}{2} \tag{1420a}$$

9.2.10 $E^1 : l = 10$

$$\frac{\sqrt{2}Y_{10,7}^{(c)}}{2} - \frac{\sqrt{2}iY_{10,7}^{(s)}}{2} \tag{1421a}$$

$$\frac{\sqrt{2}Y_{10,9}^{(c)}}{2} + \frac{\sqrt{2}iY_{10,9}^{(s)}}{2} \tag{1422a}$$

$$\frac{\sqrt{2}Y_{10,3}^{(c)}}{2} - \frac{\sqrt{2}iY_{10,3}^{(s)}}{2} \tag{1423a}$$

$$\frac{\sqrt{2}iY_{10,5}^{(c)}}{2} - \frac{\sqrt{2}Y_{10,5}^{(s)}}{2} \tag{1424a}$$

$$\frac{\sqrt{2}Y_{10,1}^{(c)}}{2} + \frac{\sqrt{2}iY_{10,1}^{(s)}}{2} \tag{1425a}$$

9.2.11 $E^1 : l = 11$

$$\frac{\sqrt{2}Y_{11,1}^{(c)}}{2} + \frac{\sqrt{2}iY_{11,1}^{(s)}}{2} \tag{1426a}$$

$$\frac{\sqrt{2}Y_{11,3}^{(c)}}{2} - \frac{\sqrt{2}iY_{11,3}^{(s)}}{2} \tag{1427a}$$

$$\frac{\sqrt{2}iY_{11,5}^{(c)}}{2} - \frac{\sqrt{2}Y_{11,5}^{(s)}}{2} \tag{1428a}$$

$$-\frac{\sqrt{2}iY_{11,11}^{(c)}}{2} - \frac{\sqrt{2}Y_{11,11}^{(s)}}{2} \tag{1429a}$$

$$\frac{\sqrt{2}Y_{11,9}^{(c)}}{2} + \frac{\sqrt{2}iY_{11,9}^{(s)}}{2} \tag{1430a}$$

$$-\frac{\sqrt{2}iY_{11,7}^{(c)}}{2} - \frac{\sqrt{2}Y_{11,7}^{(s)}}{2} \tag{1431a}$$

9.2.12 $E^1 : l = 12$

$$\frac{\sqrt{2}iY_{12,9}^{(c)}}{2} - \frac{\sqrt{2}Y_{12,9}^{(s)}}{2}$$ (1432a)

$$\frac{\sqrt{2}Y_{12,5}^{(c)}}{2} + \frac{\sqrt{2}Y_{12,5}^{(s)}}{2}$$ (1433a)

$$\frac{\sqrt{2}iY_{12,1}^{(c)}}{2} - \frac{\sqrt{2}Y_{12,1}^{(s)}}{2}$$ (1434a)

$$-\frac{\sqrt{2}iY_{12,7}^{(c)}}{2} - \frac{\sqrt{2}Y_{12,7}^{(s)}}{2}$$ (1435a)

$$\frac{\sqrt{2}Y_{12,3}^{(c)}}{2} - \frac{\sqrt{2}iY_{12,3}^{(s)}}{2}$$ (1436a)

$$\frac{\sqrt{2}Y_{12,11}^{(c)}}{2} - \frac{\sqrt{2}iY_{12,11}^{(s)}}{2}$$ (1437a)

9.3 E^2

9.3.1 $E^2 : l = 1$

$$\frac{\sqrt{2}Y_{1,1}^{(c)}}{2} - \frac{\sqrt{2}iY_{1,1}^{(s)}}{2}$$ (1438a)

9.3.2 $E^2 : l = 2$

$$-\frac{\sqrt{2}iY_{2,1}^{(c)}}{2} - \frac{\sqrt{2}Y_{2,1}^{(s)}}{2}$$ (1439a)

9.3.3 $E^2 : l = 3$

$$\frac{\sqrt{2}Y_{3,3}^{(c)}}{2} + \frac{\sqrt{2}iY_{3,3}^{(s)}}{2}$$ (1440a)

$$-\frac{\sqrt{2}iY_{3,1}^{(c)}}{2} - \frac{\sqrt{2}Y_{3,1}^{(s)}}{2}$$ (1441a)

9.3.4 $E^2 : l = 4$

$$-\frac{\sqrt{2}iY_{4,1}^{(c)}}{2} - \frac{\sqrt{2}Y_{4,1}^{(s)}}{2}$$ (1442a)

$$\frac{\sqrt{2}Y_{4,3}^{(c)}}{2} + \frac{\sqrt{2}iY_{4,3}^{(s)}}{2}$$ (1443a)

9.3.5 $E^2 : l = 5$

$$\frac{\sqrt{2}iY_{5,3}^{(c)}}{2} - \frac{\sqrt{2}Y_{5,3}^{(s)}}{2}$$ (1444a)

$$\frac{\sqrt{2}Y_{5,5}^{(c)}}{2} - \frac{\sqrt{2}iY_{5,5}^{(s)}}{2}$$ (1445a)

$$\frac{\sqrt{2}Y_{5,1}^{(c)}}{2} - \frac{\sqrt{2}iY_{5,1}^{(s)}}{2}$$ (1446a)

9.3.6 $E^2 : l = 6$

$$\frac{\sqrt{2}iY_{6,3}^{(c)}}{2} - \frac{\sqrt{2}Y_{6,3}^{(s)}}{2}$$ (1447a)

$$-\frac{\sqrt{2}iY_{6,5}^{(c)}}{2} - \frac{\sqrt{2}Y_{6,5}^{(s)}}{2}$$ (1448a)

$$-\frac{\sqrt{2}iY_{6,1}^{(c)}}{2} - \frac{\sqrt{2}Y_{6,1}^{(s)}}{2}$$ (1449a)

9.3.7 $E^2 : l = 7$

$$\frac{\sqrt{2}iY_{7,3}^{(c)}}{2} - \frac{\sqrt{2}Y_{7,3}^{(s)}}{2}$$ (1450a)

$$\frac{\sqrt{2}iY_{7,7}^{(c)}}{2} - \frac{\sqrt{2}Y_{7,7}^{(s)}}{2}$$ (1451a)

$$-\frac{\sqrt{2}iY_{7,1}^{(c)}}{2} - \frac{\sqrt{2}Y_{7,1}^{(s)}}{2}$$ (1452a)

$$\frac{\sqrt{2}Y_{7,5}^{(c)}}{2} - \frac{\sqrt{2}iY_{7,5}^{(s)}}{2}$$ (1453a)

9.3.8 $E^2 : l = 8$

$$\frac{\sqrt{2}iY_{8,7}^{(c)}}{2} - \frac{\sqrt{2}Y_{8,7}^{(s)}}{2}$$ (1454a)

$$-\frac{\sqrt{2}iY_{8,1}^{(c)}}{2} - \frac{\sqrt{2}Y_{8,1}^{(s)}}{2}$$ (1455a)

$$\frac{\sqrt{2}Y_{8,5}^{(c)}}{2} - \frac{\sqrt{2}iY_{8,5}^{(s)}}{2}$$ (1456a)

$$\frac{\sqrt{2}iY_{8,3}^{(c)}}{2} - \frac{\sqrt{2}Y_{8,3}^{(s)}}{2}$$ (1457a)

9.3.9 $E^2 : l = 9$

$$\frac{\sqrt{2}iY_{9,7}^{(c)}}{2} - \frac{\sqrt{2}Y_{9,7}^{(s)}}{2}$$ (1458a)

$$\frac{\sqrt{2}iY_{9,3}^{(c)}}{2} - \frac{\sqrt{2}Y_{9,3}^{(s)}}{2}$$ (1459a)

$$-\frac{\sqrt{2}iY_{9,9}^{(c)}}{2} - \frac{\sqrt{2}Y_{9,9}^{(s)}}{2}$$ (1460a)

$$-\frac{\sqrt{2}iY_{9,5}^{(c)}}{2} - \frac{\sqrt{2}Y_{9,5}^{(s)}}{2}$$ (1461a)

$$-\frac{\sqrt{2}iY_{9,1}^{(c)}}{2} - \frac{\sqrt{2}Y_{9,1}^{(s)}}{2}$$ (1462a)

9.3.10 $E^2 : l = 10$

$$-\frac{\sqrt{2}iY_{10,1}^{(c)}}{2} - \frac{\sqrt{2}Y_{10,1}^{(s)}}{2}$$ (1463a)

$$\frac{\sqrt{2}Y_{10,5}^{(c)}}{2} - \frac{\sqrt{2}iY_{10,5}^{(s)}}{2}$$ (1464a)

$$\frac{\sqrt{2}Y_{10,7}^{(c)}}{2} + \frac{\sqrt{2}iY_{10,7}^{(s)}}{2}$$ (1465a)

$$\frac{\sqrt{2}iY_{10,3}^{(c)}}{2} - \frac{\sqrt{2}Y_{10,3}^{(s)}}{2}$$ (1466a)

$$-\frac{\sqrt{2}iY_{10,9}^{(c)}}{2} - \frac{\sqrt{2}Y_{10,9}^{(s)}}{2}$$ (1467a)

9.3.11 $E^2 : l = 11$

$$\frac{\sqrt{2}Y_{11,7}^{(c)}}{2} + \frac{\sqrt{2}iY_{11,7}^{(s)}}{2}$$ (1468a)

$$\frac{\sqrt{2}Y_{11,11}^{(c)}}{2} + \frac{\sqrt{2}iY_{11,11}^{(s)}}{2}$$ (1469a)

$$-\frac{\sqrt{2}iY_{11,5}^{(c)}}{2} - \frac{\sqrt{2}Y_{11,5}^{(s)}}{2}$$ (1470a)

$$-\frac{\sqrt{2}iY_{11,9}^{(c)}}{2} - \frac{\sqrt{2}Y_{11,9}^{(s)}}{2}$$ (1471a)

$$\frac{\sqrt{2}Y_{11,3}^{(c)}}{2} + \frac{\sqrt{2}iY_{11,3}^{(s)}}{2}$$ (1472a)

$$\frac{\sqrt{2}Y_{11,1}^{(c)}}{2} - \frac{\sqrt{2}iY_{11,1}^{(s)}}{2}$$ (1473a)

9.3.12 $E^2 : l = 12$

$$-\frac{\sqrt{2}iY_{12,9}^{(c)}}{2} - \frac{\sqrt{2}Y_{12,9}^{(s)}}{2}$$ (1474a)

$$\frac{\sqrt{2}Y_{12,5}^{(c)}}{2} - \frac{\sqrt{2}iY_{12,5}^{(s)}}{2}$$ (1475a)

$$-\frac{\sqrt{2}iY_{12,1}^{(c)}}{2} - \frac{\sqrt{2}Y_{12,1}^{(s)}}{2}$$ (1476a)

$$\frac{\sqrt{2}Y_{12,3}^{(c)}}{2} + \frac{\sqrt{2}iY_{12,3}^{(s)}}{2}$$ (1477a)

$$\frac{\sqrt{2}Y_{12,11}^{(c)}}{2} + \frac{\sqrt{2}iY_{12,11}^{(s)}}{2}$$ (1478a)

$$\frac{\sqrt{2}Y_{12,7}^{(c)}}{2} + \frac{\sqrt{2}iY_{12,7}^{(s)}}{2}$$ (1479a)

9.4 B

9.4.1 $B : l = 2$

$$Y_{2,2}^{(c)}$$ (1480a)

$$-Y_{2,2}^{(s)}$$ (1481a)

9.4.2 $B : l = 3$

$$-Y_{3,2}^{(s)}$$ (1482a)

$$Y_{3,2}^{(c)}$$ (1483a)

9.4.3 $B : l = 4$

$$Y_{4,2}^{(c)}$$ (1484a)

$$-Y_{4,2}^{(s)}$$ (1485a)

9.4.4 $B : l = 5$

$$-Y_{5,2}^{(s)}$$ (1486a)

$$Y_{5,2}^{(c)}$$ (1487a)

9.4.5 $B : l = 6$

$$-Y_{6,6}^{(s)}$$ (1488a)

$$Y_{6,2}^{(c)}$$ (1489a)

$$-Y_{6,2}^{(s)}$$ (1490a)

$$Y_{6,6}^{(c)}$$ (1491a)

9.4.6 $B : l = 7$

$$Y_{7,2}^{(c)}$$ (1492a)

$$Y_{7,6}^{(c)}$$ (1493a)

$$-Y_{7,2}^{(s)}$$ (1494a)

$$-Y_{7,6}^{(s)}$$ (1495a)

9.4.7 $B : l = 8$

$$Y_{8,6}^{(c)}$$ (1496a)

$$Y_{8,2}^{(c)}$$ (1497a)

$$-Y_{8,2}^{(s)}$$ (1498a)

$$-Y_{8,6}^{(s)}$$ (1499a)

9.4.8 $B : l = 9$

$$-Y_{9,2}^{(s)}$$ (1500a)

$$Y_{9,2}^{(c)}$$ (1501a)

$$Y_{9,6}^{(c)}$$ (1502a)

$$-Y_{9,6}^{(s)}$$ (1503a)

9.4.9 $B : l = 10$

$$Y_{10,2}^{(c)}$$ (1504a)

$$-Y_{10,2}^{(s)}$$ (1505a)

$$-Y_{10,6}^{(s)}$$ (1506a)

$$Y_{10,6}^{(c)}$$ (1507a)

$$-Y_{10,10}^{(s)}$$ (1508a)

$$Y_{10,10}^{(c)}$$ (1509a)

9.4.10 $B : l = 11$

$$-Y_{11,6}^{(s)}$$ (1510a)

$$Y_{11,6}^{(c)}$$ (1511a)

$$-Y_{11,10}^{(s)}$$ (1512a)

$$Y_{11,2}^{(c)}$$ (1513a)

$$Y_{11,10}^{(c)}$$ (1514a)

$$-Y_{11,2}^{(s)}$$ (1515a)

9.4.11 $B : l = 12$

$$Y_{12,10}^{(c)}$$ (1516a)

$$Y_{12,6}^{(c)}$$ (1517a)

$$-Y_{12,2}^{(s)}$$ (1518a)

$$-Y_{12,6}^{(s)}$$ (1519a)

$$-Y_{12,10}^{(s)}$$ (1520a)

$$Y_{12,2}^{(c)}$$ (1521a)

10 Group S_4

10.1 A

10.1.1 $A : l = 0$

$$Y_{0,0}^{(c)}$$
(1522a)

10.1.2 $A : l = 2$

$$\frac{Y_{2,0}^{(c)}}{2} + \frac{\sqrt{3}Y_{2,2}^{(c)}}{2}$$
(1523a)

10.1.3 $A : l = 3$

$$\frac{\sqrt{10}Y_{3,1}^{(s)}}{4} - \frac{\sqrt{6}Y_{3,3}^{(s)}}{4}$$
(1524a)

$$-Y_{3,2}^{(s)}$$
(1525a)

10.1.4 $A : l = 4$

$$-\frac{\sqrt{14}Y_{4,1}^{(c)}}{4} + \frac{\sqrt{2}Y_{4,3}^{(c)}}{4}$$
(1526a)

$$\frac{\sqrt{35}Y_{4,0}^{(c)}}{12} + \frac{\sqrt{7}Y_{4,2}^{(c)}}{6} + \frac{3Y_{4,4}^{(c)}}{4}$$
(1527a)

$$\frac{2Y_{4,0}^{(c)}}{3} - \frac{\sqrt{5}Y_{4,2}^{(c)}}{3}$$
(1528a)

10.1.5 $A : l = 5$

$$-\frac{Y_{5,2}^{(s)}}{2} - \frac{\sqrt{3}Y_{5,4}^{(s)}}{2}$$
(1529a)

$$\frac{\sqrt{7}Y_{5,1}^{(s)}}{4} + \frac{\sqrt{6}Y_{5,3}^{(s)}}{8} - \frac{\sqrt{30}Y_{5,5}^{(s)}}{8}$$
(1530a)

10.1.6 $A : l = 6$

$$\frac{\sqrt{14}Y_{6,0}^{(c)}}{8} + \frac{\sqrt{15}Y_{6,2}^{(c)}}{8} + \frac{\sqrt{2}Y_{6,4}^{(c)}}{8} + \frac{\sqrt{33}Y_{6,6}^{(c)}}{8}$$
(1531a)

$$\frac{\sqrt{3}Y_{6,1}^{(c)}}{4} + \frac{\sqrt{30}Y_{6,3}^{(c)}}{8} - \frac{\sqrt{22}Y_{6,5}^{(c)}}{8}$$
(1532a)

$$\frac{\sqrt{2}Y_{6,0}^{(c)}}{4} - \frac{\sqrt{14}Y_{6,4}^{(c)}}{4}$$
(1533a)

10.1.7 $A : l = 7$

$$-\frac{\sqrt{138}Y_{7,1}^{(s)}}{16} + \frac{9\sqrt{46}Y_{7,3}^{(s)}}{368} - \frac{5\sqrt{506}Y_{7,5}^{(s)}}{368} + \frac{\sqrt{46046}Y_{7,7}^{(s)}}{368}$$
(1534a)

$$-\frac{\sqrt{6578}Y_{7,3}^{(s)}}{92} + \frac{\sqrt{598}Y_{7,5}^{(s)}}{92} + \frac{\sqrt{322}Y_{7,7}^{(s)}}{46}$$
(1535a)

$$-\frac{\sqrt{42}Y_{7,2}^{(s)}}{8} + \frac{\sqrt{231}Y_{7,4}^{(s)}}{42} - \frac{\sqrt{6006}Y_{7,6}^{(s)}}{168}$$
(1536a)

$$-\frac{\sqrt{273}Y_{7,4}^{(s)}}{21} - \frac{2\sqrt{42}Y_{7,6}^{(s)}}{21}$$
(1537a)

10.1.8 $A : l = 8$

$$-\frac{\sqrt{2310}Y_{8,1}^{(c)}}{144} + \frac{9\sqrt{2}Y_{8,3}^{(c)}}{16} + \frac{\sqrt{390}Y_{8,5}^{(c)}}{144} - \frac{\sqrt{546}Y_{8,7}^{(c)}}{48}$$
(1538a)

$$-\frac{\sqrt{286}Y_{8,0}^{(c)}}{64} + \frac{\sqrt{182}Y_{8,4}^{(c)}}{32} + \frac{\sqrt{3}Y_{8,6}^{(c)}}{2} + \frac{\sqrt{10}Y_{8,8}^{(c)}}{64}$$
(1539a)

$$-\frac{\sqrt{210}Y_{8,0}^{(c)}}{64} + \frac{\sqrt{3}Y_{8,2}^{(c)}}{2} - \frac{\sqrt{330}Y_{8,4}^{(c)}}{96} + \frac{\sqrt{6006}Y_{8,8}^{(c)}}{192}$$
(1540a)

$$\frac{\sqrt{33}Y_{8,0}^{(c)}}{8} + \frac{\sqrt{21}Y_{8,4}^{(c)}}{12} + \frac{\sqrt{195}Y_{8,8}^{(c)}}{24}$$
(1541a)

$$-\frac{\sqrt{858}Y_{8,1}^{(c)}}{36} - \frac{\sqrt{42}Y_{8,5}^{(c)}}{18} + \frac{\sqrt{30}Y_{8,7}^{(c)}}{12}$$
(1542a)

10.1.9 $A : l = 9$

$$-\frac{11Y_{9,1}^{(s)}}{16} - \frac{\sqrt{462}Y_{9,3}^{(s)}}{176} + \frac{\sqrt{1430}Y_{9,5}^{(s)}}{176} - \frac{7\sqrt{286}Y_{9,7}^{(s)}}{352} + \frac{3\sqrt{4862}Y_{9,9}^{(s)}}{352}$$
(1543a)

$$-\frac{5Y_{9,2}^{(s)}}{8} - \frac{\sqrt{182}Y_{9,4}^{(s)}}{40} + \frac{3\sqrt{39}Y_{9,6}^{(s)}}{40} - \frac{\sqrt{442}Y_{9,8}^{(s)}}{40}$$
(1544a)

$$-\frac{\sqrt{42}Y_{9,4}^{(s)}}{20} - \frac{4Y_{9,6}^{(s)}}{5} - \frac{\sqrt{102}Y_{9,8}^{(s)}}{20}$$
(1545a)

$$-\frac{\sqrt{2002}Y_{9,3}^{(s)}}{88} - \frac{3\sqrt{330}Y_{9,5}^{(s)}}{88} + \frac{5\sqrt{66}Y_{9,7}^{(s)}}{88} + \frac{\sqrt{1122}Y_{9,9}^{(s)}}{88}$$
(1546a)

10.1.10 $A : l = 10$

$$\frac{3\sqrt{3213210}Y_{10,0}^{(c)}}{23968} + \frac{\sqrt{3628905}Y_{10,10}^{(c)}}{23968} - \frac{19\sqrt{19474}Y_{10,2}^{(c)}}{23968} - \frac{83\sqrt{1498}Y_{10,4}^{(c)}}{11984} + \frac{\sqrt{749}Y_{10,6}^{(c)}}{32} + \frac{31\sqrt{76398}Y_{10,8}^{(c)}}{23968}$$

(1547a)

$$-\frac{257\sqrt{850886926890}Y_{10,0}^{(c)}}{560024304} - \frac{13\sqrt{3325144305}Y_{10,10}^{(c)}}{35001519} - \frac{5\sqrt{5156890466}Y_{10,2}^{(c)}}{23334346} + \frac{2703\sqrt{396683882}Y_{10,4}^{(c)}}{93337384} + \frac{\sqrt{70003038}Y_{10,8}^{(c)}}{11984}$$

(1548a)

$$\frac{83\sqrt{46731}Y_{10,0}^{(c)}}{46731} + \frac{\sqrt{4316916318}Y_{10,10}^{(c)}}{93462} + \frac{17\sqrt{856735}Y_{10,2}^{(c)}}{31154} + \frac{3\sqrt{11137555}Y_{10,4}^{(c)}}{31154}$$

(1549a)

$$\frac{3\sqrt{62985}Y_{10,1}^{(c)}}{1520} + \frac{11\sqrt{3230}Y_{10,3}^{(c)}}{1520} - \frac{7\sqrt{646}Y_{10,5}^{(c)}}{304} + \frac{\sqrt{190}Y_{10,7}^{(c)}}{32} - \frac{7\sqrt{30}Y_{10,9}^{(c)}}{160}$$

(1550a)

$$\frac{\sqrt{1235}Y_{10,1}^{(c)}}{380} + \frac{13\sqrt{570}Y_{10,3}^{(c)}}{760} + \frac{9\sqrt{114}Y_{10,5}^{(c)}}{152} - \frac{\sqrt{170}Y_{10,9}^{(c)}}{20}$$

(1551a)

10.1.11 $A : l = 11$

$$\frac{\sqrt{5574030}Y_{11,11}^{(s)}}{24384} + \frac{7\sqrt{421005}Y_{11,1}^{(s)}}{12192} - \frac{11\sqrt{45339}Y_{11,3}^{(s)}}{4064} - \frac{9\sqrt{21590}Y_{11,5}^{(s)}}{8128} - \frac{\sqrt{762}Y_{11,7}^{(s)}}{64} + \frac{29\sqrt{24130}Y_{11,9}^{(s)}}{8128}$$

(1552a)

$$\frac{13\sqrt{3392354658}Y_{11,11}^{(s)}}{1091184} - \frac{\sqrt{886587}Y_{11,1}^{(s)}}{1524} - \frac{29\sqrt{2386965}Y_{11,3}^{(s)}}{181864} - \frac{465\sqrt{45466}Y_{11,5}^{(s)}}{363728} - \frac{\sqrt{14685518}Y_{11,9}^{(s)}}{90932}$$

(1553a)

$$-\frac{3\sqrt{58}Y_{11,10}^{(s)}}{32} - \frac{\sqrt{327845}Y_{11,2}^{(s)}}{1392} - \frac{\sqrt{28101}Y_{11,4}^{(s)}}{348} - \frac{3\sqrt{7714}Y_{11,6}^{(s)}}{928} - \frac{\sqrt{1015}Y_{11,8}^{(s)}}{348}$$

(1554a)

$$-\frac{\sqrt{46835}Y_{11,2}^{(s)}}{1102} + \frac{3\sqrt{196707}Y_{11,4}^{(s)}}{2204} - \frac{\sqrt{1102}Y_{11,6}^{(s)}}{58} - \frac{5\sqrt{145}Y_{11,8}^{(s)}}{116}$$

(1555a)

$$-\frac{3\sqrt{1969}Y_{11,11}^{(s)}}{1432} + \frac{\sqrt{578170}Y_{11,3}^{(s)}}{1432} - \frac{\sqrt{1214157}Y_{11,5}^{(s)}}{1432} + \frac{\sqrt{3759}Y_{11,9}^{(s)}}{179}$$

(1556a)

$$-\frac{8\sqrt{19}Y_{11,2}^{(s)}}{57} + \frac{\sqrt{1995}Y_{11,4}^{(s)}}{114} + \frac{\sqrt{17}Y_{11,8}^{(s)}}{6}$$

(1557a)

10.1.12 $A : l = 12$

$$\frac{\sqrt{2510}Y_{12,0}^{(c)}}{64} - \frac{\sqrt{110664645}Y_{12,10}^{(c)}}{40160} + \frac{\sqrt{848428945}Y_{12,12}^{(c)}}{80320} - \frac{3\sqrt{7537530}Y_{12,2}^{(c)}}{40160} + \frac{3\sqrt{1256255}Y_{12,4}^{(c)}}{16064} - \frac{\sqrt{3050905}Y_{12,6}^{(c)}}{8032} + \frac{\sqrt{347803170}Y_{12,8}^{(c)}}{80320}$$

(1558a)

$$\frac{191\sqrt{88454372358}Y_{12,10}^{(c)}}{132776992} + \frac{15\sqrt{678150188078}Y_{12,12}^{(c)}}{66388496} - \frac{3737\sqrt{12447843}Y_{12,2}^{(c)}}{66388496} + \frac{\sqrt{8298562}Y_{12,4}^{(c)}}{4016} + \frac{927\sqrt{987528878}Y_{12,6}^{(c)}}{132776992} - \frac{21\sqrt{28144573023}Y_{12,8}^{(c)}}{8298562}$$

(1559a)

$$-\frac{\sqrt{77276458}Y_{12,11}^{(c)}}{47552} + \frac{\sqrt{743}Y_{12,1}^{(c)}}{32} - \frac{15\sqrt{171633}Y_{12,3}^{(c)}}{23776} + \frac{5\sqrt{5835522}Y_{12,5}^{(c)}}{47552} - \frac{5\sqrt{5279758}Y_{12,7}^{(c)}}{47552} + \frac{\sqrt{110874918}Y_{12,9}^{(c)}}{47552}$$

(1560a)

$$\frac{\sqrt{7104478326}Y_{12,11}^{(c)}}{74882512} + \frac{503\sqrt{1511690711}Y_{12,3}^{(c)}}{37441256} - \frac{2355\sqrt{177845966}Y_{12,5}^{(c)}}{74882512} - \frac{1429\sqrt{196566594}Y_{12,7}^{(c)}}{37441256} + \frac{\sqrt{9360314}Y_{12,9}^{(c)}}{5944}$$

(1561a)

$$\frac{75\sqrt{207867}Y_{12,11}^{(c)}}{50392} - \frac{3\sqrt{93590542}Y_{12,3}^{(c)}}{50392} - \frac{11\sqrt{2752663}Y_{12,5}^{(c)}}{50392} - \frac{\sqrt{3042417}Y_{12,7}^{(c)}}{6299}$$

(1562a)

$$-\frac{12821\sqrt{18919646845}Y_{12,10}^{(c)}}{27519486320} + \frac{856\sqrt{1305455632305}Y_{12,12}^{(c)}}{1719967895} + \frac{\sqrt{1111099260170}Y_{12,2}^{(c)}}{1322480} + \frac{1079\sqrt{686267190105}Y_{12,6}^{(c)}}{5503897264} - \frac{1156\sqrt{24079550530}Y_{12,8}^{(c)}}{1719967895}$$

(1563a)

$$\frac{5\sqrt{20101494}Y_{12,10}^{(c)}}{41618} + \frac{4\sqrt{291326}Y_{12,12}^{(c)}}{20809} + \frac{\sqrt{200057726}Y_{12,6}^{(c)}}{41618} + \frac{4\sqrt{15794031}Y_{12,8}^{(c)}}{20809}$$

(1564a)

10.2 E^1

10.2.1 $E^1 : l = 1$

$$-\frac{\sqrt{2}iY_{1,0}^{(c)}}{2} + \frac{\sqrt{2}Y_{1,1}^{(c)}}{2}$$

(1565a)

10.2.2 $E^1 : l = 2$

$$-\frac{\sqrt{2}Y_{2,1}^{(s)}}{2} + \frac{\sqrt{2}iY_{2,2}^{(s)}}{2}$$

(1566a)

10.2.3 $E^1 : l = 3$

$$-\frac{\sqrt{5}iY_{3,0}^{(c)}}{4} - \frac{\sqrt{3}iY_{3,2}^{(c)}}{4} + \frac{\sqrt{2}Y_{3,3}^{(c)}}{2}$$

(1567a)

$$\frac{\sqrt{3}iY_{3,0}^{(c)}}{4} + \frac{\sqrt{2}Y_{3,1}^{(c)}}{2} - \frac{\sqrt{5}iY_{3,2}^{(c)}}{4}$$

(1568a)

10.2.4 $E^1 : l = 4$

$$-\frac{\sqrt{2}Y_{4,1}^{(s)}}{2} - \frac{iY_{4,2}^{(s)}}{4} + \frac{\sqrt{7}iY_{4,4}^{(s)}}{4}$$

(1569a)

$$-\frac{\sqrt{7}Y_{4,2}^{(s)}}{4} - \frac{\sqrt{2}iY_{4,3}^{(s)}}{2} - \frac{Y_{4,4}^{(s)}}{4}$$

(1570a)

10.2.5 $E^1 : l = 5$

$$-\frac{3\sqrt{7}iY_{5,0}^{(c)}}{16} - \frac{\sqrt{15}iY_{5,2}^{(c)}}{8} - \frac{\sqrt{5}iY_{5,4}^{(c)}}{16} + \frac{\sqrt{2}Y_{5,5}^{(c)}}{2}$$

(1571a)

$$-\frac{\sqrt{30}iY_{5,0}^{(c)}}{16} + \frac{\sqrt{2}Y_{5,1}^{(c)}}{2} + \frac{\sqrt{14}iY_{5,2}^{(c)}}{8} - \frac{\sqrt{42}iY_{5,4}^{(c)}}{16}$$

(1572a)

$$-\frac{\sqrt{35}Y_{5,0}^{(c)}}{16} + \frac{\sqrt{3}Y_{5,2}^{(c)}}{8} + \frac{\sqrt{2}iY_{5,3}^{(c)}}{2} + \frac{9Y_{5,4}^{(c)}}{16}$$

(1573a)

10.2.6 $E^1 : l = 6$

$$\frac{\sqrt{330}iY_{6,2}^{(s)}}{32} + \frac{\sqrt{11}iY_{6,4}^{(s)}}{8} - \frac{\sqrt{2}Y_{6,5}^{(s)}}{2} + \frac{\sqrt{6}iY_{6,6}^{(s)}}{32} \tag{1574a}$$

$$-\frac{3\sqrt{23}iY_{6,1}^{(s)}}{23} + \frac{3\sqrt{230}Y_{6,2}^{(s)}}{736} - \frac{\sqrt{230}iY_{6,3}^{(s)}}{46} + \frac{\sqrt{69}Y_{6,4}^{(s)}}{184} - \frac{\sqrt{506}iY_{6,6}^{(s)}}{32} \tag{1575a}$$

$$-\frac{\sqrt{230}Y_{6,1}^{(s)}}{46} + \frac{2\sqrt{23}iY_{6,2}^{(s)}}{23} + \frac{3\sqrt{23}Y_{6,3}^{(s)}}{23} - \frac{\sqrt{690}iY_{6,4}^{(s)}}{46} \tag{1576a}$$

10.2.7 $E^1 : l = 7$

$$-\frac{\sqrt{858}iY_{7,0}^{(c)}}{64} - \frac{\sqrt{1001}iY_{7,2}^{(c)}}{64} - \frac{\sqrt{182}iY_{7,4}^{(c)}}{64} - \frac{\sqrt{7}iY_{7,6}^{(c)}}{64} + \frac{\sqrt{2}Y_{7,7}^{(c)}}{2} \tag{1577a}$$

$$\frac{\sqrt{1190}Y_{7,0}^{(c)}}{64} - \frac{\sqrt{170}iY_{7,1}^{(c)}}{34} - \frac{143\sqrt{255}Y_{7,2}^{(c)}}{5440} + \frac{3\sqrt{510}iY_{7,3}^{(c)}}{170} - \frac{13\sqrt{5610}Y_{7,4}^{(c)}}{5440} - \frac{\sqrt{5610}iY_{7,5}^{(c)}}{170} - \frac{\sqrt{36465}Y_{7,6}^{(c)}}{5440} \tag{1578a}$$

$$\frac{\sqrt{102}Y_{7,1}^{(c)}}{17} - \frac{7\sqrt{17}iY_{7,2}^{(c)}}{136} + \frac{3\sqrt{34}Y_{7,3}^{(c)}}{68} + \frac{\sqrt{374}iY_{7,4}^{(c)}}{34} - \frac{\sqrt{374}Y_{7,5}^{(c)}}{68} - \frac{\sqrt{2431}iY_{7,6}^{(c)}}{136} \tag{1579a}$$

$$-\frac{\sqrt{55}Y_{7,2}^{(c)}}{40} + \frac{\sqrt{110}iY_{7,3}^{(c)}}{20} + \frac{\sqrt{10}Y_{7,4}^{(c)}}{10} + \frac{3\sqrt{10}iY_{7,5}^{(c)}}{20} + \frac{3\sqrt{65}Y_{7,6}^{(c)}}{40} \tag{1580a}$$

10.2.8 $E^1 : l = 8$

$$\frac{\sqrt{35}iY_{8,1}^{(s)}}{64} - \frac{\sqrt{2}Y_{8,2}^{(s)}}{2} - \frac{3\sqrt{33}iY_{8,3}^{(s)}}{64} + \frac{\sqrt{715}iY_{8,5}^{(s)}}{64} - \frac{\sqrt{1001}iY_{8,7}^{(s)}}{64} \tag{1581a}$$

$$\frac{5\sqrt{1334333}Y_{8,1}^{(s)}}{85312} - \frac{33\sqrt{259935}iY_{8,3}^{(s)}}{85312} + \frac{3\sqrt{17329}Y_{8,4}^{(s)}}{1333} - \frac{\sqrt{1333}Y_{8,5}^{(s)}}{64} + \frac{7\sqrt{55986}iY_{8,6}^{(s)}}{2666} - \frac{143\sqrt{46655}Y_{8,7}^{(s)}}{85312} + \frac{\sqrt{46655}iY_{8,8}^{(s)}}{1333} \tag{1582a}$$

$$-\frac{7\sqrt{158213770}Y_{8,1}^{(s)}}{442556} + \frac{33\sqrt{60408894}Y_{8,3}^{(s)}}{442556} + \frac{113\sqrt{100681490}iY_{8,4}^{(s)}}{1770224} - \frac{47\sqrt{1659585}iY_{8,6}^{(s)}}{221278} - \frac{\sqrt{221278}Y_{8,7}^{(s)}}{1333} - \frac{459\sqrt{221278}iY_{8,8}^{(s)}}{1770224} \tag{1583a}$$

$$-\frac{3\sqrt{5478}Y_{8,1}^{(s)}}{332} - \frac{\sqrt{5810}Y_{8,3}^{(s)}}{332} + \frac{\sqrt{3486}iY_{8,4}^{(s)}}{1328} - \frac{\sqrt{1079}Y_{8,6}^{(s)}}{166} + \frac{5\sqrt{32370}Y_{8,8}^{(s)}}{1328} \tag{1584a}$$

10.2.9 $E^1 : l = 9$

$$-\frac{\sqrt{12155}iY_{9,0}^{(c)}}{256} - \frac{3\sqrt{442}iY_{9,2}^{(c)}}{128} - \frac{3\sqrt{119}iY_{9,4}^{(c)}}{128} - \frac{\sqrt{102}iY_{9,6}^{(c)}}{128} - \frac{3iY_{9,8}^{(c)}}{256} + \frac{\sqrt{2}Y_{9,9}^{(c)}}{2} \tag{1585a}$$

$$-\frac{663\sqrt{2365}Y_{9,0}^{(c)}}{77056} - \frac{\sqrt{473}iY_{9,1}^{(c)}}{43} + \frac{7\sqrt{86}Y_{9,2}^{(c)}}{128} + \frac{3\sqrt{1806}iY_{9,3}^{(c)}}{301} - \frac{153\sqrt{3913}Y_{9,4}^{(c)}}{38528} - \frac{\sqrt{5590}iY_{9,5}^{(c)}}{301} - \frac{51\sqrt{3354}Y_{9,6}^{(c)}}{38528} - \frac{\sqrt{1118}iY_{9,7}^{(c)}}{602} - \frac{9\sqrt{9503}Y_{9,8}^{(c)}}{77056} \tag{1586a}$$

$$-\frac{3\sqrt{30468295}Y_{9,0}^{(c)}}{1193164} + \frac{73\sqrt{6093659}iY_{9,1}^{(c)}}{681808} + \frac{1067\sqrt{23266698}iY_{9,3}^{(c)}}{9545312} - \frac{9\sqrt{29829I}Y_{9,4}^{(c)}}{596582} + \frac{5209\sqrt{426130}iY_{9,5}^{(c)}}{9545312} - \frac{3\sqrt{255678}Y_{9,6}^{(c)}}{596582} + \frac{1829\sqrt{85226}iY_{9,7}^{(c)}}{4772656} + \frac{\sqrt{72442I}Y_{9,8}^{(c)}}{1204} \tag{1587a}$$

$$\frac{2\sqrt{17348777985}iY_{9,0}^{(c)}}{15020587} + \frac{1693\sqrt{3469755597}Y_{9,1}^{(c)}}{240329392} + \frac{\sqrt{30041174}Y_{9,3}^{(c)}}{31712} - \frac{146\sqrt{585802893}iY_{9,4}^{(c)}}{15020587} - \frac{1193\sqrt{41006202510}Y_{9,5}^{(c)}}{480658784} + \frac{383\sqrt{2733746834}iY_{9,6}^{(c)}}{30041174} - \frac{565\sqrt{8201240502}Y_{9,7}^{(c)}}{240329392} \tag{1588a}$$

$$\frac{9\sqrt{394082}iY_{9,0}^{(c)}}{15157} + \frac{\sqrt{1970410}Y_{9,1}^{(c)}}{30314} - \frac{5\sqrt{11670890}iY_{9,4}^{(c)}}{30314} - \frac{9\sqrt{166727}Y_{9,5}^{(c)}}{15157} - \frac{2\sqrt{2500905}iY_{9,6}^{(c)}}{15157} + \frac{11\sqrt{833635}Y_{9,7}^{(c)}}{15157} \tag{1589a}$$

10.2.10 $E^1 : l = 10$

$$-\frac{9\sqrt{39}iY_{10,1}^{(s)}}{256} + \frac{69\sqrt{2}iY_{10,3}^{(s)}}{256} + \frac{\sqrt{10}iY_{10,5}^{(s)}}{256} - \frac{\sqrt{2}Y_{10,6}^{(s)}}{2} - \frac{43\sqrt{34}iY_{10,7}^{(s)}}{512} - \frac{3\sqrt{1938}iY_{10,9}^{(s)}}{512} \tag{1590a}$$

$$-\frac{7\sqrt{6}iY_{10,1}^{(s)}}{256} - \frac{\sqrt{2}Y_{10,2}^{(s)}}{2} + \frac{7\sqrt{13}iY_{10,3}^{(s)}}{128} - \frac{5\sqrt{65}Y_{10,5}^{(s)}}{128} + \frac{7\sqrt{221}iY_{10,7}^{(s)}}{256} - \frac{\sqrt{12597}iY_{10,9}^{(s)}}{256} \tag{1591a}$$

$$\frac{\sqrt{442}iY_{10,1}^{(s)}}{64} - \frac{\sqrt{51}iY_{10,3}^{(s)}}{32} - \frac{\sqrt{255}Y_{10,5}^{(s)}}{32} - \frac{11\sqrt{3}iY_{10,7}^{(s)}}{64} - \frac{\sqrt{2}Y_{10,8}^{(s)}}{2} - \frac{\sqrt{19}iY_{10,9}^{(s)}}{64} \tag{1592a}$$

$$\frac{\sqrt{310130}iY_{10,10}^{(s)}}{62026} + \frac{91\sqrt{130223587}Y_{10,1}^{(s)}}{7939328} - \frac{357\sqrt{60103194}iY_{10,3}^{(s)}}{7939328} + \frac{4\sqrt{30051597}iY_{10,4}^{(s)}}{31013} + \frac{159\sqrt{300515970}Y_{10,5}^{(s)}}{7939328} - \frac{549\sqrt{3535482}Y_{10,7}^{(s)}}{15878656} - \frac{\sqrt{62026}iY_{10,9}^{(s)}}{512} \tag{1593a}$$

$$-\frac{4\sqrt{30051597}Y_{10,10}^{(s)}}{31013} - \frac{81\sqrt{12095070}iY_{10,1}^{(s)}}{496208} - \frac{479\sqrt{155065}iY_{10,3}^{(s)}}{496208} + \frac{\sqrt{310130}Y_{10,4}^{(s)}}{62026} - \frac{497\sqrt{31013}iY_{10,5}^{(s)}}{496208} - \frac{7\sqrt{2636105}iY_{10,7}^{(s)}}{248104} \tag{1594a}$$

10.2.11 $E^1 : l = 11$

$$\frac{\sqrt{248710}iY_{11,11}^{(c)}}{1024} + \frac{21\sqrt{65}iY_{11,1}^{(c)}}{512} + \frac{\sqrt{2}Y_{11,2}^{(c)}}{2} - \frac{57\sqrt{7}iY_{11,3}^{(c)}}{512} + \frac{41\sqrt{30}iY_{11,5}^{(c)}}{1024} - \frac{17\sqrt{34}iY_{11,7}^{(c)}}{1024} - \frac{\sqrt{9690}iY_{11,9}^{(c)}}{1024} \tag{1595a}$$

$$-\frac{\sqrt{111005070}iY_{11,0}^{(c)}}{39574} - \frac{7\sqrt{171058615}iY_{11,10}^{(c)}}{514462} + \frac{289\sqrt{3763289530}Y_{11,11}^{(c)}}{263404544} + \frac{357\sqrt{1681895}Y_{11,1}^{(c)}}{10130944} - \frac{969\sqrt{30610489}iY_{11,3}^{(c)}}{131702272}$$
$$+ \frac{3\sqrt{918314670}Y_{11,4}^{(c)}}{257231} + \frac{697\sqrt{131187810}iY_{11,5}^{(c)}}{263404544} - \frac{105\sqrt{1286155}iY_{11,6}^{(c)}}{514462} + \frac{\sqrt{514462}Y_{11,7}^{(c)}}{1024} - \frac{77\sqrt{9774778}iY_{11,8}^{(c)}}{514462} - \frac{289\sqrt{146621670}Y_{11,9}^{(c)}}{263404544} \tag{1596a}$$

$$-\frac{525\sqrt{10197747167718}Y_{11,0}^{(c)}}{18177802438} - \frac{3675\sqrt{15714710207651}Y_{11,10}^{(c)}}{236311431694} + \frac{9687\sqrt{345723624568322}iY_{11,11}^{(c)}}{1890491453552} + \frac{7170\sqrt{154511320723}iY_{11,1}^{(c)}}{9088901219} + \frac{5609\sqrt{70302650928965}iY_{11,3}^{(c)}}{945245726776}$$
$$+ \frac{1575\sqrt{84363181114758}Y_{11,4}^{(c)}}{118155715847} - \frac{218737\sqrt{12051883016394}iY_{11,5}^{(c)}}{1890491453552} + \frac{\sqrt{118155715847}Y_{11,6}^{(c)}}{514462} - \frac{8085\sqrt{22449586010930}iY_{11,8}^{(c)}}{236311431694} - \frac{30943\sqrt{13469751606558}iY_{11,9}^{(c)}}{236311431694} \tag{1597a}$$

$$-\frac{55609\sqrt{131880543555933354}iY_{11,0}^{(c)}}{35894408479824} + \frac{1992\sqrt{8225801943293}iY_{11,10}^{(c)}}{747800176663} + \frac{3\sqrt{1495600353326}Y_{11,11}^{(c)}}{7349392} - \frac{590\sqrt{241780996519211149}Y_{11,1}^{(c)}}{747800176663} - \frac{14707\sqrt{13284670138418195}Y_{11,3}^{(c)}}{5982401413304}$$
$$- \frac{60869\sqrt{15941604166101834}iY_{11,4}^{(c)}}{17947204239912} - \frac{15191\sqrt{111591229162712838I}Y_{11,5}^{(c)}}{35894408479824} - \frac{3107\sqrt{575806136030510}iY_{11,8}^{(c)}}{11964802826608} + \frac{931\sqrt{345483681618306}Y_{11,9}^{(c)}}{4486801059978} \tag{1598a}$$

$$\frac{1839467\sqrt{919812927887997}iY_{11,0}^{(c)}}{205832263583328} - \frac{10614\sqrt{33548641000714}iY_{11,10}^{(c)}}{126122710529} - \frac{2320\sqrt{557462380538818}iY_{11,1}^{(c)}}{2144086078993} + \frac{84845\sqrt{1500860255295510}Y_{11,3}^{(c)}}{4288172157986}$$
$$- \frac{5541097\sqrt{45025807658853}iY_{11,4}^{(c)}}{102916131791664} + \frac{\sqrt{6432258236979}Y_{11,5}^{(c)}}{4883997} - \frac{281807\sqrt{11981657500255}iY_{11,8}^{(c)}}{4035926736928} + \frac{58444\sqrt{7188994500153}iY_{11,9}^{(c)}}{378368131587} \tag{1599a}$$

$$-\frac{97\sqrt{5780343723}iY_{11,0}^{(c)}}{42144224} - \frac{26\sqrt{2014246}iY_{11,10}^{(c)}}{77471} + \frac{53\sqrt{350323862}Y_{11,1}^{(c)}}{2634014} + \frac{12\sqrt{3253007290}iY_{11,3}^{(c)}}{1317007} + \frac{145\sqrt{975902187}iY_{11,4}^{(c)}}{21072112} + \frac{185\sqrt{35249305}iY_{11,8}^{(c)}}{2479072} - \frac{5\sqrt{21149583}iY_{11,9}^{(c)}}{77471} \tag{1600a}$$

10.2.12 $E^1 : l = 12$

$$-\frac{\sqrt{2}Y^{(s)}_{12,10}}{2} - \frac{5\sqrt{23}iY^{(s)}_{12,11}}{1024} + \frac{5\sqrt{4522}iY^{(s)}_{12,1}}{1024} - \frac{\sqrt{21318}iY^{(s)}_{12,3}}{1024} - \frac{19\sqrt{627}iY^{(s)}_{12,5}}{1024} - \frac{43\sqrt{77}iY^{(s)}_{12,7}}{1024} - \frac{25\sqrt{33}iY^{(s)}_{12,9}}{1024}$$

(1601a)

$$\frac{\sqrt{61653308145}Y^{(s)}_{12,11}}{51504128} + \frac{\sqrt{41102205430}iY^{(s)}_{12,12}}{502970} - \frac{323\sqrt{116186070}Y^{(s)}_{12,1}}{51504128} + \frac{9\sqrt{754455}iY^{(s)}_{12,2}}{50297} - \frac{\sqrt{502970}Y^{(s)}_{12,3}}{1024} - \frac{201\sqrt{502970}Y^{(s)}_{12,4}}{502970}$$
$$+ \frac{11913\sqrt{4275245}Y^{(s)}_{12,5}}{257520640} + \frac{23\sqrt{59853430}iY^{(s)}_{12,6}}{502970} + \frac{473\sqrt{1705822755}Y^{(s)}_{12,7}}{257520640} - \frac{2\sqrt{1705822755}iY^{(s)}_{12,8}}{251485} + \frac{165\sqrt{81229655}Y^{(s)}_{12,9}}{51504128}$$

(1602a)

$$-\frac{3131\sqrt{3253506724119795}iY^{(s)}_{12,11}}{339740542336} - \frac{201\sqrt{2169004482746530}Y^{(s)}_{12,12}}{53084459740} - \frac{39551\sqrt{6131255099970}iY^{(s)}_{12,1}}{67948108467 2} - \frac{1809\sqrt{39813344805}Y^{(s)}_{12,2}}{5308445974} - \frac{\sqrt{26542229870}Y^{(s)}_{12,4}}{251485}$$
$$- \frac{1186357\sqrt{225608953895}iY^{(s)}_{12,5}}{1698702711680} - \frac{4623\sqrt{31585253545305}iY^{(s)}_{12,6}}{53084459740} + \frac{106191\sqrt{9001797260410 5}iY^{(s)}_{12,7}}{3397405423360} + \frac{201\sqrt{9001797260410 5}Y^{(s)}_{12,8}}{13271114935} + \frac{23007\sqrt{4286570124005}iY^{(s)}_{12,9}}{679481084672}$$

(1603a)

$$\frac{363265\sqrt{6023551468040813}Y^{(s)}_{12,11}}{252047920205696} + \frac{22783\sqrt{36141308808244878}iY^{(s)}_{12,12}}{7876497506428} - \frac{\sqrt{66950228804638}Y^{(s)}_{12,1}}{13509376} - \frac{7257\sqrt{2577583808978563}iY^{(s)}_{12,2}}{3938248753214} - \frac{2169885\sqrt{454867730996217}Y^{(s)}_{12,5}}{252047920205696}$$
$$- \frac{184655\sqrt{129962208856062}iY^{(s)}_{12,6}}{7876497506428} - \frac{6927725\sqrt{411546994710863}Y^{(s)}_{12,7}}{504095840411392} + \frac{33263\sqrt{411546994710863}iY^{(s)}_{12,8}}{1969124376607} - \frac{520205\sqrt{8642486888928123}Y^{(s)}_{12,9}}{504095840411392}$$

(1604a)

$$\frac{29329\sqrt{26812084988731}Y^{(s)}_{12,11}}{333069378742} + \frac{1647\sqrt{160872509932386}iY^{(s)}_{12,12}}{333069378742} - \frac{51815\sqrt{4141884259346141}iY^{(s)}_{12,2}}{7327526332324} - \frac{\sqrt{730920751649319}Y^{(s)}_{12,5}}{74629034}$$
$$- \frac{147603\sqrt{208834500471234}iY^{(s)}_{12,6}}{7327526332324} + \frac{490444\sqrt{1831881583081}Y^{(s)}_{12,7}}{1831881583081} - \frac{2446581\sqrt{1831881583081}iY^{(s)}_{12,8}}{7327526332324} + \frac{50778\sqrt{38469513244701}Y^{(s)}_{12,9}}{1831881583081}$$

(1605a)

$$-\frac{2\sqrt{13389}Y^{(s)}_{12,11}}{4463} + \frac{\sqrt{8926}iY^{(s)}_{12,12}}{8926} + \frac{3\sqrt{1094135691}iY^{(s)}_{12,2}}{196372} - \frac{5\sqrt{300350974}Y^{(s)}_{12,6}}{196372} - \frac{5\sqrt{23711919}Y^{(s)}_{12,7}}{98186} - \frac{9\sqrt{23711919}iY^{(s)}_{12,8}}{196372} + \frac{61\sqrt{1129139}Y^{(s)}_{12,9}}{98186}$$

(1606a)

10.3 E^2

10.3.1 $E^2 : l = 1$

$$\frac{\sqrt{2}Y^{(c)}_{1,0}}{2} - \frac{\sqrt{2}iY^{(c)}_{1,1}}{2}$$

(1607a)

10.3.2 $E^2 : l = 2$

$$-\frac{\sqrt{2}Y^{(s)}_{2,1}}{2} - \frac{\sqrt{2}iY^{(s)}_{2,2}}{2}$$

(1608a)

10.3.3 $E^2 : l = 3$

$$-\frac{\sqrt{5}iY^{(c)}_{3,1}}{4} + \frac{\sqrt{2}Y^{(c)}_{3,2}}{2} - \frac{\sqrt{3}iY^{(c)}_{3,3}}{4}$$

(1609a)

$$\frac{\sqrt{2}Y^{(c)}_{3,0}}{2} + \frac{\sqrt{3}iY^{(c)}_{3,1}}{4} - \frac{\sqrt{5}iY^{(c)}_{3,3}}{4}$$

(1610a)

10.3.4 $E^2 : l = 4$

$$-\frac{iY^{(s)}_{4,1}}{4} - \frac{\sqrt{2}Y^{(s)}_{4,2}}{2} + \frac{\sqrt{7}iY^{(s)}_{4,3}}{4}$$

(1611a)

$$-\frac{\sqrt{7}Y^{(s)}_{4,1}}{4} - \frac{Y^{(s)}_{4,3}}{4} - \frac{\sqrt{2}iY^{(s)}_{4,4}}{2}$$

(1612a)

10.3.5 $E^2 : l = 5$

$$-\frac{\sqrt{35}iY^{(c)}_{5,0}}{16} + \frac{\sqrt{3}iY^{(c)}_{5,2}}{8} + \frac{\sqrt{2}Y^{(c)}_{5,3}}{2} + \frac{9iY^{(c)}_{5,4}}{16}$$

(1613a)

$$\frac{\sqrt{93}Y^{(c)}_{5,0}}{16} - \frac{\sqrt{155}iY^{(c)}_{5,1}}{31} + \frac{\sqrt{1085}Y^{(c)}_{5,2}}{248} + \frac{3\sqrt{3255}Y^{(c)}_{5,4}}{496} - \frac{\sqrt{1302}iY^{(c)}_{5,5}}{62}$$

(1614a)

$$\frac{\sqrt{1302}iY^{(c)}_{5,1}}{62} + \frac{3\sqrt{186}iY^{(c)}_{5,2}}{62} - \frac{\sqrt{62}Y^{(c)}_{5,4}}{31} - \frac{\sqrt{155}iY^{(c)}_{5,5}}{31}$$

(1615a)

10.3.6 $E^2 : l = 6$

$$-\frac{\sqrt{2}Y^{(s)}_{6,1}}{2} - \frac{\sqrt{5}iY^{(s)}_{6,2}}{16} + \frac{\sqrt{6}iY^{(s)}_{6,4}}{8} - \frac{3\sqrt{11}iY^{(s)}_{6,6}}{16}$$

(1616a)

$$-\frac{\sqrt{123}Y^{(s)}_{6,2}}{16} - \frac{3\sqrt{123}iY^{(s)}_{6,3}}{82} - \frac{\sqrt{410}Y^{(s)}_{6,4}}{328} + \frac{\sqrt{2255}Y^{(s)}_{6,5}}{82} + \frac{\sqrt{6765}Y^{(s)}_{6,6}}{656}$$

(1617a)

$$\frac{\sqrt{2255}iY^{(s)}_{6,3}}{82} - \frac{\sqrt{2706}Y^{(s)}_{6,4}}{82} + \frac{3\sqrt{123}iY^{(s)}_{6,5}}{82} - \frac{2\sqrt{41}Y^{(s)}_{6,6}}{41}$$

(1618a)

10.3.7 $E^2 : l = 7$

$$-\frac{\sqrt{462}iY^{(c)}_{7,0}}{64} + \frac{\sqrt{11}iY^{(c)}_{7,2}}{64} + \frac{25\sqrt{2}iY^{(c)}_{7,4}}{64} + \frac{\sqrt{2}Y^{(c)}_{7,5}}{2} + \frac{5\sqrt{13}iY^{(c)}_{7,6}}{64}$$

(1619a)

$$-\frac{5\sqrt{14}iY^{(c)}_{7,0}}{64} + \frac{\sqrt{2}Y^{(c)}_{7,1}}{2} + \frac{15\sqrt{3}iY^{(c)}_{7,2}}{64} - \frac{3\sqrt{66}iY^{(c)}_{7,4}}{64} + \frac{\sqrt{429}iY^{(c)}_{7,6}}{64}$$

(1620a)

$$\frac{43\sqrt{1589}Y^{(c)}_{7,0}}{7264} + \frac{\sqrt{1362}Y^{(c)}_{7,2}}{64} + \frac{19\sqrt{681}iY^{(c)}_{7,3}}{1362} + \frac{55\sqrt{7491}Y^{(c)}_{7,4}}{21792} - \frac{25\sqrt{194766}Y^{(c)}_{7,6}}{43584} - \frac{\sqrt{681681}iY^{(c)}_{7,7}}{1362}$$

(1621a)

$$\frac{5\sqrt{3246}iY^{(c)}_{7,0}}{1816} - \frac{\sqrt{681681}iY^{(c)}_{7,3}}{1362} + \frac{\sqrt{6197}iY^{(c)}_{7,4}}{5448} + \frac{7\sqrt{9534}iY^{(c)}_{7,6}}{1362} - \frac{19\sqrt{681}iY^{(c)}_{7,7}}{1362}$$

(1622a)

10.3.8 $E^2 : l = 8$

$$-\frac{3\sqrt{33}iY_{8,2}^{(s)}}{64} - \frac{\sqrt{2}Y_{8,3}^{(s)}}{2} + \frac{5\sqrt{30}iY_{8,4}^{(s)}}{64} - \frac{\sqrt{455}iY_{8,6}^{(s)}}{64} - \frac{\sqrt{546}iY_{8,8}^{(s)}}{64}$$
(1623a)

$$\frac{\sqrt{715}iY_{8,2}^{(s)}}{64} - \frac{3\sqrt{26}iY_{8,4}^{(s)}}{64} - \frac{\sqrt{2}Y_{8,5}^{(s)}}{2} - \frac{7\sqrt{21}iY_{8,6}^{(s)}}{64} - \frac{\sqrt{70}iY_{8,8}^{(s)}}{64}$$
(1624a)

$$-\frac{\sqrt{13442}iY_{8,1}^{(s)}}{188} - \frac{\sqrt{235235}Y_{8,2}^{(s)}}{1504} - \frac{\sqrt{8554}Y_{8,4}^{(s)}}{1504} - \frac{\sqrt{141}Y_{8,6}^{(s)}}{32} + \frac{3\sqrt{470}iY_{8,7}^{(s)}}{188} + \frac{35\sqrt{470}Y_{8,8}^{(s)}}{1504}$$
(1625a)

$$\frac{3\sqrt{470}Y_{8,1}^{(s)}}{188} - \frac{\sqrt{329}Y_{8,2}^{(s)}}{47} - \frac{\sqrt{36190}Y_{8,4}^{(s)}}{376} + \frac{\sqrt{13442}iY_{8,7}^{(s)}}{188} - \frac{\sqrt{13442}Y_{8,8}^{(s)}}{376}$$
(1626a)

10.3.9 $E^2 : l = 9$

$$\frac{21\sqrt{10}iY_{9,0}^{(c)}}{256} + \frac{\sqrt{2}Y_{9,1}^{(c)}}{2} - \frac{7\sqrt{11}iY_{9,2}^{(c)}}{64} + \frac{\sqrt{2002}iY_{9,4}^{(c)}}{128} - \frac{\sqrt{429}iY_{9,6}^{(c)}}{64} + \frac{\sqrt{4862}iY_{9,8}^{(c)}}{256}$$
(1627a)

$$-\frac{\sqrt{1155}iY_{9,0}^{(c)}}{128} + \frac{3\sqrt{42}iY_{9,2}^{(c)}}{64} + \frac{\sqrt{2}Y_{9,3}^{(c)}}{2} - \frac{\sqrt{39}iY_{9,4}^{(c)}}{64} - \frac{\sqrt{182}iY_{9,6}^{(c)}}{64} + \frac{\sqrt{4641}iY_{9,8}^{(c)}}{128}$$
(1628a)

$$\frac{7\sqrt{12616890}Y_{9,0}^{(c)}}{132864} - \frac{49\sqrt{114699}Y_{9,2}^{(c)}}{99648} - \frac{65\sqrt{123522}Y_{9,4}^{(c)}}{199296} - \frac{5\sqrt{44115}iY_{9,5}^{(c)}}{1557} + \frac{325\sqrt{2941}Y_{9,6}^{(c)}}{33216} - \frac{7\sqrt{8823}iY_{9,7}^{(c)}}{3114} + \frac{3\sqrt{1038}Y_{9,8}^{(c)}}{256} - \frac{\sqrt{519}iY_{9,9}^{(c)}}{1038}$$
(1629a)

$$-\frac{31\sqrt{8534955}Y_{9,0}^{(c)}}{334236} + \frac{1915\sqrt{310362}Y_{9,2}^{(c)}}{8021664} + \frac{4043\sqrt{83559}Y_{9,4}^{(c)}}{2005416} + \frac{305\sqrt{119370}Y_{9,5}^{(c)}}{501354} + \frac{49\sqrt{7958}Y_{9,6}^{(c)}}{16608} - \frac{1061\sqrt{23874}iY_{9,7}^{(c)}}{250677} - \frac{22\sqrt{405858}Y_{9,9}^{(c)}}{83559}$$
(1630a)

$$\frac{\sqrt{6578}iY_{9,0}^{(c)}}{161} + \frac{2\sqrt{1495}iY_{9,2}^{(c)}}{161} + \frac{\sqrt{1610}iY_{9,4}^{(c)}}{322} + \frac{\sqrt{23}Y_{9,5}^{(c)}}{161} - \frac{5\sqrt{115}Y_{9,7}^{(c)}}{322} + \frac{5\sqrt{1955}Y_{9,9}^{(c)}}{322}$$
(1631a)

10.3.10 $E^2 : l = 10$

$$-\frac{\sqrt{20995}iY_{10,10}^{(s)}}{256} - \frac{\sqrt{2}Y_{10,1}^{(s)}}{2} - \frac{7\sqrt{6}iY_{10,2}^{(s)}}{256} + \frac{\sqrt{78}iY_{10,4}^{(s)}}{64} - \frac{9\sqrt{39}iY_{10,6}^{(s)}}{256} + \frac{\sqrt{442}iY_{10,8}^{(s)}}{64}$$
(1632a)

$$\frac{7\sqrt{6051405}Y_{10,10}^{(s)}}{319744} - \frac{\sqrt{32474}Y_{10,2}^{(s)}}{256} - \frac{7\sqrt{1249}iY_{10,3}^{(s)}}{1249} - \frac{21\sqrt{2498}Y_{10,4}^{(s)}}{79936} + \frac{5\sqrt{6245}iY_{10,5}^{(s)}}{1249} + \frac{189\sqrt{1249}Y_{10,6}^{(s)}}{319744} - \frac{7\sqrt{21233}iY_{10,7}^{(s)}}{2498} - \frac{7\sqrt{127398}Y_{10,8}^{(s)}}{79936} + \frac{\sqrt{1210281}iY_{10,9}^{(s)}}{2498}$$
(1633a)

$$-\frac{251\sqrt{9548605}iY_{10,10}^{(s)}}{15277768} - \frac{7\sqrt{1850519649}Y_{10,3}^{(s)}}{1909721} - \frac{307\sqrt{3701039298}iY_{10,4}^{(s)}}{30555536} + \frac{5\sqrt{9252598245}Y_{10,5}^{(s)}}{1909721} - \frac{123\sqrt{1850519649}iY_{10,6}^{(s)}}{15277768} - \frac{119\sqrt{108854097}Y_{10,7}^{(s)}}{3819442} - \frac{223\sqrt{72569398}iY_{10,8}^{(s)}}{30555536} - \frac{\sqrt{1909721}Y_{10,9}^{(s)}}{2498}$$
(1634a)

$$\frac{201\sqrt{240249010155}Y_{10,10}^{(s)}}{396695992} - \frac{8031\sqrt{49586999}iY_{10,3}^{(s)}}{99173998} + \frac{25065\sqrt{99173998}Y_{10,4}^{(s)}}{793391984} + \frac{133\sqrt{247934995}iY_{10,5}^{(s)}}{14167714} - \frac{\sqrt{49586999}Y_{10,6}^{(s)}}{12232} + \frac{668\sqrt{842978983}iY_{10,7}^{(s)}}{49586999} - \frac{993\sqrt{5057873898}Y_{10,8}^{(s)}}{793391984}$$
(1635a)

$$-\frac{8\sqrt{1848567}iY_{10,10}^{(s)}}{32431} - \frac{13\sqrt{2756635}Y_{10,3}^{(s)}}{64862} + \frac{5\sqrt{5513270}iY_{10,4}^{(s)}}{129724} - \frac{7\sqrt{551327}Y_{10,5}^{(s)}}{9266} - \frac{22\sqrt{162155}iY_{10,7}^{(s)}}{32431} - \frac{81\sqrt{972930}Y_{10,8}^{(s)}}{129724}$$
(1636a)

10.3.11 $E^2 : l = 11$

$$-\frac{\sqrt{92378}iY_{11,0}^{(c)}}{1024} + \frac{9\sqrt{21}iY_{11,10}^{(c)}}{1024} - \frac{\sqrt{9690}iY_{11,2}^{(c)}}{1024} + \frac{3\sqrt{4522}iY_{11,4}^{(c)}}{512} + \frac{61\sqrt{57}iY_{11,6}^{(c)}}{1024} + \frac{39\sqrt{30}iY_{11,8}^{(c)}}{1024} + \frac{\sqrt{2}Y_{11,9}^{(c)}}{2}$$
(1637a)

$$-\frac{15\sqrt{286}iY_{11,0}^{(c)}}{1024} + \frac{5\sqrt{6783}iY_{11,10}^{(c)}}{1024} + \frac{41\sqrt{30}iY_{11,2}^{(c)}}{1024} + \frac{13\sqrt{14}iY_{11,4}^{(c)}}{512} + \frac{\sqrt{2}Y_{11,5}^{(c)}}{2} - \frac{53\sqrt{51}iY_{11,6}^{(c)}}{1024} + \frac{3\sqrt{9690}iY_{11,8}^{(c)}}{1024}$$
(1638a)

$$\frac{3\sqrt{10210}Y_{11,0}^{(c)}}{512} + \frac{7\sqrt{4951691745}Y_{11,10}^{(c)}}{2613760} - \frac{\sqrt{900307590}iY_{11,11}^{(c)}}{61260} + \frac{7\sqrt{168465}iY_{11,1}^{(c)}}{10210} + \frac{73\sqrt{876018}Y_{11,2}^{(c)}}{1568256}$$
$$- \frac{\sqrt{3066063}iY_{11,3}^{(c)}}{6126} + \frac{97\sqrt{10220210}Y_{11,4}^{(c)}}{1306880} + \frac{91\sqrt{37230765}Y_{11,6}^{(c)}}{7841280} - \frac{\sqrt{14892306}iY_{11,7}^{(c)}}{12252} + \frac{7\sqrt{282953814}Y_{11,8}^{(c)}}{522752}$$
(1639a)

$$-\frac{205877\sqrt{312262770482915}Y_{11,10}^{(c)}}{8259307784960} - \frac{7183\sqrt{687780950624130}iY_{11,11}^{(c)}}{387155052420} - \frac{8059\sqrt{8807777442555}iY_{11,1}^{(c)}}{64525842070} + \frac{\sqrt{271008536694}Y_{11,2}^{(c)}}{784128} + \frac{92515\sqrt{19357752621}iY_{11,3}^{(c)}}{38715505242}$$
$$+ \frac{41047\sqrt{64525842070}Y_{11,4}^{(c)}}{1032413473120} + \frac{1332937\sqrt{11517862809495}Y_{11,6}^{(c)}}{24777923354880} + \frac{4465\sqrt{4607145123798}iY_{11,7}^{(c)}}{77431010484} - \frac{881\sqrt{87535757352162}Y_{11,8}^{(c)}}{103241347312}$$
(1640a)

$$\frac{521071\sqrt{7245714275378635}Y_{11,10}^{(c)}}{108958109404190} + \frac{68979\sqrt{159405714058329970}iY_{11,11}^{(c)}}{217916218808380} - \frac{963713\sqrt{12039871089162995}iY_{11,1}^{(c)}}{217916218808380} - \frac{222057\sqrt{1296601501909861}iY_{11,3}^{(c)}}{43583243761676}$$
$$- \frac{126724\sqrt{38898045057295830}Y_{11,4}^{(c)}}{54479054702095} + \frac{3\sqrt{54479054702095}Y_{11,6}^{(c)}}{63198670} - \frac{4328037\sqrt{21791621880838}iY_{11,7}^{(c)}}{43583243761676} + \frac{17428\sqrt{414040815735922}Y_{11,8}^{(c)}}{10895810940419}$$
(1641a)

$$-\frac{200\sqrt{8620285}iY_{11,10}^{(c)}}{1724057} - \frac{43\sqrt{189646270}Y_{11,11}^{(c)}}{6896228} - \frac{3\sqrt{253376037005}Y_{11,1}^{(c)}}{6896228} - \frac{153\sqrt{556870411}Y_{11,3}^{(c)}}{6896228} - \frac{7\sqrt{16706112330}iY_{11,4}^{(c)}}{3448114} + \frac{133\sqrt{458599162}Y_{11,7}^{(c)}}{6896228} + \frac{197\sqrt{24136798}iY_{11,8}^{(c)}}{1724057}$$
(1642a)

10.3.12 $E^2 : l = 12$

$$\frac{\sqrt{100947}iY_{12,11}^{(s)}}{1024} - \frac{5\sqrt{1122}iY_{12,1}^{(s)}}{1024} + \frac{23\sqrt{238}iY_{12,3}^{(s)}}{1024} - \frac{75\sqrt{7}iY_{12,5}^{(s)}}{1024} - \frac{\sqrt{2}Y_{12,6}^{(s)}}{2} - \frac{29\sqrt{57}iY_{12,7}^{(s)}}{1024} + \frac{37\sqrt{133}iY_{12,9}^{(s)}}{1024}$$
(1643a)

$$-\frac{5\sqrt{19473686}iY_{12,10}^{(s)}}{846682} - \frac{\sqrt{423341}Y_{12,11}^{(s)}}{1024} - \frac{\sqrt{2540046}iY_{12,12}^{(s)}}{846682} - \frac{165\sqrt{44030004046}Y_{12,1}^{(s)}}{433501184} - \frac{\sqrt{34595003179}iY_{12,2}^{(s)}}{423341} + \frac{161\sqrt{207570019074}iY_{12,3}^{(s)}}{433501184}$$
$$- \frac{\sqrt{207570019074}iY_{12,4}^{(s)}}{846682} - \frac{525\sqrt{610500561}Y_{12,5}^{(s)}}{433501184} - \frac{1653\sqrt{749736911}Y_{12,7}^{(s)}}{433501184} - \frac{2\sqrt{749736911}iY_{12,8}^{(s)}}{423341} + \frac{4921\sqrt{3213151819}Y_{12,9}^{(s)}}{433501184}$$
(1644a)

$$\frac{115\sqrt{3909280483144419}Y_{12,10}^{(s)}}{110027595923} + \frac{\sqrt{269740353336694911}Y_{12,12}^{(s)}}{110027595923} - \frac{38997\sqrt{172900507879}iY_{12,1}^{(s)}}{125745823912} - \frac{\sqrt{220055191846}Y_{12,2}^{(s)}}{846682} + \frac{125809\sqrt{330082787769}iY_{12,3}^{(s)}}{220055191846}$$
$$+ \frac{81719\sqrt{330082787769}Y_{12,4}^{(s)}}{110027595923} - \frac{12800\sqrt{11222814784146}iY_{12,5}^{(s)}}{110027595923} + \frac{26539\sqrt{101539752808944}iY_{12,7}^{(s)}}{251491647824} + \frac{506\sqrt{101539752808944}Y_{12,8}^{(s)}}{15718227989} - \frac{40079\sqrt{213233480898774}iY_{12,9}^{(s)}}{1760441534768}$$
(1645a)

$$-\frac{8\sqrt{526563478}Y_{12,10}^{(s)}}{259903} + \frac{5\sqrt{36332879982}Y_{12,12}^{(s)}}{8425015648} - \frac{1295\sqrt{24297143342}iY_{12,1}^{(s)}}{601786832} + \frac{141\sqrt{5612640112002}iY_{12,3}^{(s)}}{2106253912} + \frac{115\sqrt{5612640112002}Y_{12,4}^{(s)}}{8425015648}$$
$$+ \frac{1167\sqrt{165077650353}iY_{12,5}^{(s)}}{1053126956} + \frac{11091\sqrt{413728447}iY_{12,7}^{(s)}}{601786832} + \frac{115\sqrt{413728447}Y_{12,8}^{(s)}}{300893416} + \frac{6245\sqrt{8688297387}iY_{12,9}^{(s)}}{4212507824}$$
(1646a)

$$-\frac{127\sqrt{46854242402}iY_{12,12}^{(s)}}{45868640} - \frac{707\sqrt{132445698}Y_{12,1}^{(s)}}{22934320} - \frac{5\sqrt{573358}Y_{12,3}^{(s)}}{8104} - \frac{5193\sqrt{573358}Y_{12,4}^{(s)}}{45868640} - \frac{777\sqrt{4873543}Y_{12,5}^{(s)}}{5733580} + \frac{87\sqrt{1944543657}Y_{12,7}^{(s)}}{22934320} + \frac{19\sqrt{1944543657}iY_{12,8}^{(s)}}{2293432} + \frac{467\sqrt{92597317}Y_{12,9}^{(s)}}{22934320}$$
(1647a)

$$-\frac{3\sqrt{501193}iY_{12,12}^{(s)}}{5660} - \frac{3\sqrt{3016497}Y_{12,1}^{(s)}}{11320} + \frac{\sqrt{639863}iY_{12,4}^{(s)}}{5660} + \frac{\sqrt{752278}Y_{12,5}^{(s)}}{2830} - \frac{221\sqrt{1698}Y_{12,7}^{(s)}}{22640} - \frac{4\sqrt{1698}iY_{12,8}^{(s)}}{283} - \frac{123\sqrt{3962}Y_{12,9}^{(s)}}{22640}$$
(1648a)

10.4 B

10.4.1 $B : l = 1$

$$-Y_{1,1}^{(s)}$$

(1649a)

10.4.2 $B : l = 2$

$$Y_{2,1}^{(c)}$$

(1650a)

$$-\frac{\sqrt{3}Y_{2,0}^{(c)}}{2} + \frac{Y_{2,2}^{(c)}}{2}$$

(1651a)

10.4.3 $B : l = 3$

$$-\frac{\sqrt{6}Y_{3,1}^{(s)}}{4} - \frac{\sqrt{10}Y_{3,3}^{(s)}}{4}$$

(1652a)

10.4.4 $B : l = 4$

$$\frac{\sqrt{2}Y_{4,1}^{(c)}}{4} + \frac{\sqrt{14}Y_{4,3}^{(c)}}{4}$$

(1653a)

$$\frac{\sqrt{5}Y_{4,0}^{(c)}}{4} + \frac{Y_{4,2}^{(c)}}{2} - \frac{\sqrt{7}Y_{4,4}^{(c)}}{4}$$

(1654a)

10.4.5 $B : l = 5$

$$-\frac{\sqrt{1785}Y_{5,1}^{(s)}}{68} - \frac{3\sqrt{170}Y_{5,3}^{(s)}}{136} - \frac{\sqrt{34}Y_{5,5}^{(s)}}{8}$$

(1655a)

$$-\frac{\sqrt{51}Y_{5,1}^{(s)}}{17} + \frac{\sqrt{238}Y_{5,3}^{(s)}}{17}$$

(1656a)

$$\frac{\sqrt{3}Y_{5,2}^{(s)}}{2} - \frac{Y_{5,4}^{(s)}}{2}$$

(1657a)

10.4.6 $B : l = 6$

$$\frac{\sqrt{42}Y_{6,0}^{(c)}}{8} - \frac{\sqrt{5}Y_{6,2}^{(c)}}{8} + \frac{\sqrt{6}Y_{6,4}^{(c)}}{8} - \frac{\sqrt{11}Y_{6,6}^{(c)}}{8}$$

(1658a)

$$\frac{\sqrt{11}Y_{6,2}^{(c)}}{4} - \frac{\sqrt{5}Y_{6,6}^{(c)}}{4}$$

(1659a)

$$\frac{\sqrt{77}Y_{6,1}^{(c)}}{28} + \frac{\sqrt{770}Y_{6,3}^{(c)}}{56} + \frac{\sqrt{42}Y_{6,5}^{(c)}}{8}$$

(1660a)

$$\frac{\sqrt{35}Y_{6,1}^{(c)}}{7} - \frac{\sqrt{14}Y_{6,3}^{(c)}}{7}$$

(1661a)

10.4.7 $B : l = 7$

$$\frac{\sqrt{22}Y_{7,2}^{(s)}}{8} + \frac{Y_{7,4}^{(s)}}{2} - \frac{\sqrt{26}Y_{7,6}^{(s)}}{8}$$

(1662a)

$$\frac{5\sqrt{7062}Y_{7,1}^{(s)}}{1712} - \frac{11\sqrt{2354}Y_{7,3}^{(s)}}{1712} - \frac{\sqrt{214}Y_{7,5}^{(s)}}{16} - \frac{\sqrt{19474}Y_{7,7}^{(s)}}{1712}$$

(1663a)

$$-\frac{7\sqrt{1498}Y_{7,1}^{(s)}}{428} - \frac{\sqrt{4494}Y_{7,3}^{(s)}}{214} - \frac{\sqrt{91806}Y_{7,7}^{(s)}}{428}$$

(1664a)

10.4.8 $B : l = 8$

$$-\frac{3\sqrt{3157}Y_{8,0}^{(c)}}{656} + \frac{\sqrt{4510}Y_{8,2}^{(c)}}{328} + \frac{\sqrt{41}Y_{8,4}^{(c)}}{8} - \frac{\sqrt{22386}Y_{8,6}^{(c)}}{328} - \frac{\sqrt{18655}Y_{8,8}^{(c)}}{656}$$

(1665a)

$$-\frac{\sqrt{7995}Y_{8,0}^{(c)}}{164} - \frac{\sqrt{22386}Y_{8,2}^{(c)}}{328} - \frac{\sqrt{4510}Y_{8,6}^{(c)}}{328} + \frac{3\sqrt{1353}Y_{8,8}^{(c)}}{164}$$

(1666a)

$$\frac{\sqrt{58}Y_{8,1}^{(c)}}{16} + \frac{\sqrt{66990}Y_{8,3}^{(c)}}{464} - \frac{\sqrt{58058}Y_{8,5}^{(c)}}{464} + \frac{\sqrt{41470}Y_{8,7}^{(c)}}{464}$$

(1667a)

$$\frac{\sqrt{754}Y_{8,3}^{(c)}}{116} + \frac{3\sqrt{870}Y_{8,5}^{(c)}}{116} + \frac{\sqrt{1218}Y_{8,7}^{(c)}}{58}$$

(1668a)

10.4.9 $B : l = 9$

$$\frac{\sqrt{3315}Y_{9,2}^{(s)}}{120} + \frac{\sqrt{3570}Y_{9,4}^{(s)}}{120} + \frac{\sqrt{85}Y_{9,6}^{(s)}}{40} - \frac{\sqrt{30}Y_{9,8}^{(s)}}{8}$$

(1669a)

$$-\frac{3\sqrt{624767}Y_{9,1}^{(s)}}{4112} - \frac{\sqrt{2385474}Y_{9,3}^{(s)}}{4112} - \frac{3\sqrt{43690}Y_{9,5}^{(s)}}{4112} - \frac{3\sqrt{8738}Y_{9,7}^{(s)}}{8224} - \frac{\sqrt{514}Y_{9,9}^{(s)}}{32}$$

(1670a)

$$-\frac{\sqrt{1365}Y_{9,2}^{(s)}}{60} + \frac{2\sqrt{30}Y_{9,4}^{(s)}}{15} - \frac{\sqrt{35}Y_{9,6}^{(s)}}{20}$$

(1671a)

$$-\frac{13\sqrt{6832345}Y_{9,1}^{(s)}}{420452} + \frac{7\sqrt{3156543390}Y_{9,3}^{(s)}}{840904} - \frac{\sqrt{2312486}Y_{9,5}^{(s)}}{2056} - \frac{59\sqrt{11562430}Y_{9,7}^{(s)}}{420452}$$

(1672a)

$$\frac{\sqrt{31493}Y_{9,1}^{(s)}}{409} - \frac{5\sqrt{2454}Y_{9,3}^{(s)}}{409} - \frac{\sqrt{74438}Y_{9,7}^{(s)}}{409}$$

(1673a)

10.4.10 $B : l = 10$

$$\frac{\sqrt{4789070}Y_{10,0}^{(c)}}{6304} - \frac{\sqrt{18715}Y_{10,10}^{(c)}}{6304} + \frac{\sqrt{261222}Y_{10,2}^{(c)}}{6304} - \frac{11\sqrt{20094}Y_{10,4}^{(c)}}{3152} - \frac{31\sqrt{10047}Y_{10,6}^{(c)}}{6304} + \frac{\sqrt{394}Y_{10,8}^{(c)}}{32}$$

(1674a)

$$-\frac{25\sqrt{132208670}Y_{10,0}^{(c)}}{1201897} - \frac{49\sqrt{25233827515}Y_{10,10}^{(c)}}{19230352} + \frac{\sqrt{7211382}Y_{10,2}^{(c)}}{3152} - \frac{125\sqrt{93747966}Y_{10,4}^{(c)}}{7211382} + \frac{1331\sqrt{46873983}Y_{10,6}^{(c)}}{57691056}$$

(1675a)

$$\frac{3\sqrt{715}Y_{10,1}^{(c)}}{176} - \frac{\sqrt{330}Y_{10,3}^{(c)}}{528} + \frac{\sqrt{66}Y_{10,5}^{(c)}}{16} + \frac{7\sqrt{5610}Y_{10,7}^{(c)}}{1056} + \frac{\sqrt{35530}Y_{10,9}^{(c)}}{352}$$

(1676a)

$$-\frac{51\sqrt{5831969}Y_{10,1}^{(c)}}{211112} - \frac{41\sqrt{2691678}Y_{10,3}^{(c)}}{316668} + \frac{\sqrt{158334}Y_{10,7}^{(c)}}{528} - \frac{91\sqrt{1002782}Y_{10,9}^{(c)}}{422224}$$

(1677a)

$$-\frac{\sqrt{16576417}Y_{10,0}^{(c)}}{6101} + \frac{31\sqrt{207434}Y_{10,10}^{(c)}}{24404} - \frac{13\sqrt{1738785}Y_{10,4}^{(c)}}{36606} - \frac{\sqrt{3477570}Y_{10,6}^{(c)}}{73212}$$

(1678a)

$$-\frac{5\sqrt{45581}Y_{10,1}^{(c)}}{2399} + \frac{\sqrt{3555318}Y_{10,3}^{(c)}}{2399} + \frac{\sqrt{1060358}Y_{10,9}^{(c)}}{2399}$$

(1679a)

10.4.11 $B : l = 11$

$$-\frac{\sqrt{1314610}Y_{11,11}^{(s)}}{2368} - \frac{\sqrt{16835}Y_{11,1}^{(s)}}{1184} - \frac{3\sqrt{37}Y_{11,3}^{(s)}}{32} - \frac{35\sqrt{7770}Y_{11,5}^{(s)}}{7104} + \frac{11\sqrt{8806}Y_{11,7}^{(s)}}{2368} - \frac{\sqrt{2509710}Y_{11,9}^{(s)}}{7104}$$

(1680a)

$$\frac{\sqrt{1938}Y_{11,10}^{(s)}}{64} - \frac{\sqrt{105}Y_{11,2}^{(s)}}{32} - \frac{Y_{11,4}^{(s)}}{2} - \frac{\sqrt{714}Y_{11,6}^{(s)}}{64}$$

(1681a)

$$-\frac{\sqrt{2942885946}Y_{11,11}^{(s)}}{109224} - \frac{3\sqrt{4551}Y_{11,1}^{(s)}}{296} + \frac{125\sqrt{39442}Y_{11,5}^{(s)}}{109224} - \frac{7\sqrt{10057710}Y_{11,7}^{(s)}}{72816} + \frac{23\sqrt{12739766}Y_{11,9}^{(s)}}{218448}$$

(1682a)

$$\frac{\sqrt{70}Y_{11,10}^{(s)}}{64} - \frac{\sqrt{323}Y_{11,2}^{(s)}}{32} + \frac{3\sqrt{190}Y_{11,6}^{(s)}}{64} - \frac{Y_{11,8}^{(s)}}{2}$$

(1683a)

$$-\frac{7\sqrt{861}Y_{11,11}^{(s)}}{1476} - \frac{\sqrt{145673}Y_{11,5}^{(s)}}{1476} - \frac{\sqrt{128535}Y_{11,7}^{(s)}}{492} - \frac{43\sqrt{451}Y_{11,9}^{(s)}}{1476}$$

(1684a)

10.4.12 $B : l = 12$

$$\frac{\sqrt{1586}Y_{12,0}^{(c)}}{64} + \frac{\sqrt{413763}Y_{12,10}^{(c)}}{1952} - \frac{\sqrt{3172183}Y_{12,12}^{(c)}}{3904} + \frac{3\sqrt{28182}Y_{12,2}^{(c)}}{1952} - \frac{15\sqrt{4697}Y_{12,4}^{(c)}}{3904} + \frac{5\sqrt{11407}Y_{12,6}^{(c)}}{1952} - \frac{\sqrt{1300398}Y_{12,8}^{(c)}}{3904}$$

(1685a)

$$\frac{\sqrt{164255190}Y_{12,11}^{(c)}}{21440} + \frac{3\sqrt{77385}Y_{12,1}^{(c)}}{2144} + \frac{\sqrt{335}Y_{12,3}^{(c)}}{32} + \frac{27\sqrt{11390}Y_{12,5}^{(c)}}{21440} + \frac{\sqrt{4544610}Y_{12,7}^{(c)}}{21440} - \frac{17\sqrt{216410}Y_{12,9}^{(c)}}{21440}$$

(1686a)

$$\frac{29\sqrt{1332518110}Y_{12,11}^{(c)}}{3009640} - \frac{\sqrt{1336656365}Y_{12,1}^{(c)}}{601928} + \frac{49\sqrt{300211590}Y_{12,5}^{(c)}}{3009640} + \frac{3421\sqrt{752410}Y_{12,7}^{(c)}}{6019280} + \frac{\sqrt{15800610}Y_{12,9}^{(c)}}{5360}$$

(1687a)

$$-\frac{\sqrt{490751}Y_{12,11}^{(c)}}{4492} + \frac{3\sqrt{267274}Y_{12,1}^{(c)}}{4492} - \frac{17\sqrt{37059}Y_{12,5}^{(c)}}{4492} + \frac{\sqrt{1642949}Y_{12,7}^{(c)}}{2246}$$

(1688a)

$$-\frac{\sqrt{5074102}Y_{12,10}^{(c)}}{388448} - \frac{5\sqrt{350113038}Y_{12,12}^{(c)}}{194224} + \frac{\sqrt{206363}Y_{12,2}^{(c)}}{976} + \frac{95\sqrt{1238178}Y_{12,4}^{(c)}}{194224} - \frac{235\sqrt{509838}Y_{12,6}^{(c)}}{388448} + \frac{5\sqrt{1614487}Y_{12,8}^{(c)}}{24278}$$

(1689a)

$$-\frac{5\sqrt{2189}Y_{12,10}^{(c)}}{398} - \frac{\sqrt{151041}Y_{12,12}^{(c)}}{1592} + \frac{\sqrt{192831}Y_{12,4}^{(c)}}{1592} + \frac{\sqrt{79401}Y_{12,6}^{(c)}}{398} + \frac{\sqrt{2786}Y_{12,8}^{(c)}}{398}$$

(1690a)

11 Group C_{4h}

11.1 Γ^1

11.1.1 $\Gamma^1 : l = 0$

$$Y_{0,0}^{(c)} \tag{1691a}$$

11.1.2 $\Gamma^1 : l = 2$

$$Y_{2,0}^{(c)} \tag{1692a}$$

11.1.3 $\Gamma^1 : l = 4$

$$-Y_{4,4}^{(s)} \tag{1693a}$$

$$Y_{4,0}^{(c)} \tag{1694a}$$

$$Y_{4,4}^{(c)} \tag{1695a}$$

11.1.4 $\Gamma^1 : l = 6$

$$-Y_{6,4}^{(s)} \tag{1696a}$$

$$Y_{6,4}^{(c)} \tag{1697a}$$

$$Y_{6,0}^{(c)} \tag{1698a}$$

11.1.5 $\Gamma^1 : l = 8$

$$Y_{8,8}^{(c)} \tag{1699a}$$

$$Y_{8,0}^{(c)} \tag{1700a}$$

$$Y_{8,4}^{(c)} \tag{1701a}$$

$$-Y_{8,8}^{(s)} \tag{1702a}$$

$$-Y_{8,4}^{(s)} \tag{1703a}$$

11.1.6 $\Gamma^1 : l = 10$

$$-Y_{10,8}^{(s)} \tag{1704a}$$

$$-Y_{10,4}^{(s)} \tag{1705a}$$

$$Y_{10,0}^{(c)} \tag{1706a}$$

$$Y_{10,8}^{(c)} \tag{1707a}$$

$$Y_{10,4}^{(c)} \tag{1708a}$$

11.1.7 $\Gamma^1 : l = 12$

$$-Y_{12,4}^{(s)} \tag{1709a}$$

$$Y_{12,4}^{(c)} \tag{1710a}$$

$$-Y_{12,12}^{(s)} \tag{1711a}$$

$$Y_{12,8}^{(c)} \tag{1712a}$$

$$-Y_{12,8}^{(s)} \tag{1713a}$$

$$Y_{12,0}^{(c)} \tag{1714a}$$

$$Y_{12,12}^{(c)} \tag{1715a}$$

11.2 Γ^2

11.2.1 $\Gamma^2 : l = 1$

$$\frac{\sqrt{2}iY_{1,1}^{(c)}}{2} - \frac{\sqrt{2}Y_{1,1}^{(s)}}{2} \tag{1716a}$$

11.2.2 $\Gamma^2 : l = 3$

$$\frac{\sqrt{2}iY_{3,1}^{(c)}}{2} - \frac{\sqrt{2}Y_{3,1}^{(s)}}{2} \tag{1717a}$$

$$\frac{\sqrt{2}Y_{3,3}^{(c)}}{2} - \frac{\sqrt{2}iY_{3,3}^{(s)}}{2} \tag{1718a}$$

11.2.3 $\Gamma^2 : l = 5$

$$\frac{\sqrt{2}iY_{5,5}^{(c)}}{2} - \frac{\sqrt{2}Y_{5,5}^{(s)}}{2} \tag{1719a}$$

$$\frac{\sqrt{2}iY_{5,1}^{(c)}}{2} - \frac{\sqrt{2}Y_{5,1}^{(s)}}{2} \tag{1720a}$$

$$-\frac{\sqrt{2}iY_{5,3}^{(c)}}{2} - \frac{\sqrt{2}Y_{5,3}^{(s)}}{2} \tag{1721a}$$

11.2.4 $\Gamma^2 : l = 7$

$$\frac{\sqrt{2}Y_{7,7}^{(c)}}{2} - \frac{\sqrt{2}iY_{7,7}^{(s)}}{2} \tag{1722a}$$

$$\frac{\sqrt{2}Y_{7,3}^{(c)}}{2} - \frac{\sqrt{2}iY_{7,3}^{(s)}}{2} \tag{1723a}$$

$$\frac{\sqrt{2}iY_{7,1}^{(c)}}{2} - \frac{\sqrt{2}Y_{7,1}^{(s)}}{2} \tag{1724a}$$

$$\frac{\sqrt{2}Y_{7,5}^{(c)}}{2} + \frac{\sqrt{2}iY_{7,5}^{(s)}}{2} \tag{1725a}$$

11.2.5 $\Gamma^2 : l = 9$

$$\frac{\sqrt{2}Y_{9,9}^{(c)}}{2} + \frac{\sqrt{2}iY_{9,9}^{(s)}}{2} \tag{1726a}$$

$$\frac{\sqrt{2}Y_{9,5}^{(c)}}{2} - \frac{\sqrt{2}iY_{9,5}^{(s)}}{2} \tag{1727a}$$

$$\frac{\sqrt{2}Y_{9,1}^{(c)}}{2} + \frac{\sqrt{2}iY_{9,1}^{(s)}}{2} \tag{1728a}$$

$$\frac{\sqrt{2}Y_{9,7}^{(c)}}{2} - \frac{\sqrt{2}iY_{9,7}^{(s)}}{2} \tag{1729a}$$

$$-\frac{\sqrt{2}iY_{9,3}^{(c)}}{2} - \frac{\sqrt{2}Y_{9,3}^{(s)}}{2} \tag{1730a}$$

11.2.6 $\Gamma^2 : l = 11$

$$\frac{\sqrt{2}Y_{11,1}^{(c)}}{2} + \frac{\sqrt{2}iY_{11,1}^{(s)}}{2} \tag{1731a}$$

$$\frac{\sqrt{2}Y_{11,3}^{(c)}}{2} - \frac{\sqrt{2}iY_{11,3}^{(s)}}{2} \tag{1732a}$$

$$\frac{\sqrt{2}iY_{11,5}^{(c)}}{2} - \frac{\sqrt{2}Y_{11,5}^{(s)}}{2} \tag{1733a}$$

$$-\frac{\sqrt{2}iY_{11,11}^{(c)}}{2} - \frac{\sqrt{2}Y_{11,11}^{(s)}}{2} \tag{1734a}$$

$$\frac{\sqrt{2}Y_{11,9}^{(c)}}{2} + \frac{\sqrt{2}iY_{11,9}^{(s)}}{2} \tag{1735a}$$

$$-\frac{\sqrt{2}iY_{11,7}^{(c)}}{2} - \frac{\sqrt{2}Y_{11,7}^{(s)}}{2} \tag{1736a}$$

11.3 Γ^3

11.3.1 $\Gamma^3 : l = 1$

$$\frac{\sqrt{2}Y_{1,1}^{(c)}}{2} - \frac{\sqrt{2}iY_{1,1}^{(s)}}{2} \tag{1737a}$$

11.3.2 $\Gamma^3 : l = 3$

$$\frac{\sqrt{2}Y_{3,3}^{(c)}}{2} + \frac{\sqrt{2}iY_{3,3}^{(s)}}{2} \tag{1738a}$$

$$-\frac{\sqrt{2}iY_{3,1}^{(c)}}{2} - \frac{\sqrt{2}Y_{3,1}^{(s)}}{2} \tag{1739a}$$

11.3.3 $\Gamma^3 : l = 5$

$$\frac{\sqrt{2}iY_{5,3}^{(c)}}{2} - \frac{\sqrt{2}Y_{5,3}^{(s)}}{2} \tag{1740a}$$

$$\frac{\sqrt{2}Y_{5,5}^{(c)}}{2} - \frac{\sqrt{2}iY_{5,5}^{(s)}}{2} \tag{1741a}$$

$$\frac{\sqrt{2}Y_{5,1}^{(c)}}{2} - \frac{\sqrt{2}iY_{5,1}^{(s)}}{2} \tag{1742a}$$

11.3.4 $\Gamma^3 : l = 7$

$$\frac{\sqrt{2}iY_{7,3}^{(c)}}{2} - \frac{\sqrt{2}Y_{7,3}^{(s)}}{2} \tag{1743a}$$

$$\frac{\sqrt{2}iY_{7,7}^{(c)}}{2} - \frac{\sqrt{2}Y_{7,7}^{(s)}}{2} \tag{1744a}$$

$$-\frac{\sqrt{2}iY_{7,1}^{(c)}}{2} - \frac{\sqrt{2}Y_{7,1}^{(s)}}{2} \tag{1745a}$$

$$\frac{\sqrt{2}Y_{7,5}^{(c)}}{2} - \frac{\sqrt{2}iY_{7,5}^{(s)}}{2} \tag{1746a}$$

11.3.5 $\Gamma^3 : l = 9$

$$\frac{\sqrt{2}iY_{9,7}^{(c)}}{2} - \frac{\sqrt{2}Y_{9,7}^{(s)}}{2} \tag{1747a}$$

$$\frac{\sqrt{2}iY_{9,3}^{(c)}}{2} - \frac{\sqrt{2}Y_{9,3}^{(s)}}{2} \tag{1748a}$$

$$-\frac{\sqrt{2}iY_{9,9}^{(c)}}{2} - \frac{\sqrt{2}Y_{9,9}^{(s)}}{2} \tag{1749a}$$

$$-\frac{\sqrt{2}iY_{9,5}^{(c)}}{2} - \frac{\sqrt{2}Y_{9,5}^{(s)}}{2} \tag{1750a}$$

$$-\frac{\sqrt{2}iY_{9,1}^{(c)}}{2} - \frac{\sqrt{2}Y_{9,1}^{(s)}}{2} \tag{1751a}$$

11.3.6 $\Gamma^3 : l = 11$

$$\frac{\sqrt{2}Y_{11,7}^{(c)}}{2} + \frac{\sqrt{2}iY_{11,7}^{(s)}}{2} \tag{1752a}$$

$$\frac{\sqrt{2}Y_{11,11}^{(c)}}{2} + \frac{\sqrt{2}iY_{11,11}^{(s)}}{2} \tag{1753a}$$

$$-\frac{\sqrt{2}iY_{11,5}^{(c)}}{2} - \frac{\sqrt{2}Y_{11,5}^{(s)}}{2} \tag{1754a}$$

$$-\frac{\sqrt{2}iY_{11,9}^{(c)}}{2} - \frac{\sqrt{2}Y_{11,9}^{(s)}}{2} \tag{1755a}$$

$$\frac{\sqrt{2}Y_{11,3}^{(c)}}{2} + \frac{\sqrt{2}iY_{11,3}^{(s)}}{2} \tag{1756a}$$

$$\frac{\sqrt{2}Y_{11,1}^{(c)}}{2} - \frac{\sqrt{2}iY_{11,1}^{(s)}}{2} \tag{1757a}$$

11.4 Γ^4

11.4.1 $\Gamma^4 : l = 1$

$$Y_{1,0}^{(c)} \tag{1758a}$$

11.4.2 $\Gamma^4 : l = 3$

$$Y_{3,0}^{(c)} \tag{1759a}$$

11.4.3 $\Gamma^4 : l = 5$

$$Y_{5,4}^{(c)} \tag{1760a}$$

$$-Y_{5,4}^{(s)} \tag{1761a}$$

$$Y_{5,0}^{(c)} \tag{1762a}$$

11.4.4 $\Gamma^4 : l = 7$

$$Y_{7,0}^{(c)} \tag{1763a}$$

$$Y_{7,4}^{(c)} \tag{1764a}$$

$$-Y_{7,4}^{(s)} \tag{1765a}$$

11.4.5 $\Gamma^4 : l = 9$

$$Y_{9,8}^{(c)} \tag{1766a}$$

$$Y_{9,0}^{(c)} \tag{1767a}$$

$$Y_{9,4}^{(c)} \tag{1768a}$$

$$-Y_{9,4}^{(s)} \tag{1769a}$$

$$-Y_{9,8}^{(s)} \tag{1770a}$$

11.4.6 $\Gamma^4 : l = 11$

$$-Y_{11,4}^{(s)} \tag{1771a}$$

$$-Y_{11,8}^{(s)} \tag{1772a}$$

$$Y_{11,0}^{(c)} \tag{1773a}$$

$$Y_{11,8}^{(c)} \tag{1774a}$$

$$Y_{11,4}^{(c)} \tag{1775a}$$

11.5 Γ^5

11.5.1 $\Gamma^5 : l = 3$

$$-Y_{3,2}^{(s)} \tag{1776a}$$

$$Y_{3,2}^{(c)} \tag{1777a}$$

11.5.2 $\Gamma^5 : l = 5$

$$-Y_{5,2}^{(s)} \tag{1778a}$$

$$Y_{5,2}^{(c)} \tag{1779a}$$

11.5.3 $\Gamma^5 : l = 7$

$$Y_{7,2}^{(c)} \tag{1780a}$$

$$Y_{7,6}^{(c)} \tag{1781a}$$

$$-Y_{7,2}^{(s)} \tag{1782a}$$

$$-Y_{7,6}^{(s)} \tag{1783a}$$

11.5.4 $\Gamma^5 : l = 9$

$$-Y_{9,2}^{(s)} \tag{1784a}$$

$$Y_{9,2}^{(c)} \tag{1785a}$$

$$Y_{9,6}^{(c)} \tag{1786a}$$

$$-Y_{9,6}^{(s)} \tag{1787a}$$

11.5.5 $\Gamma^5 : l = 11$

$$-Y_{11,6}^{(s)} \tag{1788a}$$

$$Y_{11,6}^{(c)} \tag{1789a}$$

$$-Y_{11,10}^{(s)} \tag{1790a}$$

$$Y_{11,2}^{(c)} \tag{1791a}$$

$$Y_{11,10}^{(c)} \tag{1792a}$$

$$-Y_{11,2}^{(s)} \tag{1793a}$$

11.6 Γ^6

11.6.1 $\Gamma^6 : l = 2$

$$-\frac{\sqrt{2}i Y_{2,1}^{(c)}}{2} - \frac{\sqrt{2} Y_{2,1}^{(s)}}{2} \tag{1794a}$$

11.6.2 $\Gamma^6 : l = 4$

$$-\frac{\sqrt{2}i Y_{4,1}^{(c)}}{2} - \frac{\sqrt{2} Y_{4,1}^{(s)}}{2} \tag{1795a}$$

$$\frac{\sqrt{2} Y_{4,3}^{(c)}}{2} + \frac{\sqrt{2}i Y_{4,3}^{(s)}}{2} \tag{1796a}$$

11.6.3 $\Gamma^6 : l = 6$

$$\frac{\sqrt{2}i Y_{6,3}^{(c)}}{2} - \frac{\sqrt{2} Y_{6,3}^{(s)}}{2} \tag{1797a}$$

$$-\frac{\sqrt{2}i Y_{6,5}^{(c)}}{2} - \frac{\sqrt{2} Y_{6,5}^{(s)}}{2} \tag{1798a}$$

$$-\frac{\sqrt{2}i Y_{6,1}^{(c)}}{2} - \frac{\sqrt{2} Y_{6,1}^{(s)}}{2} \tag{1799a}$$

11.6.4 $\Gamma^6 : l = 8$

$$\frac{\sqrt{2}i Y_{8,7}^{(c)}}{2} - \frac{\sqrt{2} Y_{8,7}^{(s)}}{2} \tag{1800a}$$

$$-\frac{\sqrt{2}i Y_{8,1}^{(c)}}{2} - \frac{\sqrt{2} Y_{8,1}^{(s)}}{2} \tag{1801a}$$

$$\frac{\sqrt{2} Y_{8,5}^{(c)}}{2} - \frac{\sqrt{2}i Y_{8,5}^{(s)}}{2} \tag{1802a}$$

$$\frac{\sqrt{2}i Y_{8,3}^{(c)}}{2} - \frac{\sqrt{2} Y_{8,3}^{(s)}}{2} \tag{1803a}$$

11.6.5 $\Gamma^6 : l = 10$

$$-\frac{\sqrt{2}i Y_{10,1}^{(c)}}{2} - \frac{\sqrt{2} Y_{10,1}^{(s)}}{2} \tag{1804a}$$

$$\frac{\sqrt{2} Y_{10,5}^{(c)}}{2} - \frac{\sqrt{2}i Y_{10,5}^{(s)}}{2} \tag{1805a}$$

$$\frac{\sqrt{2} Y_{10,7}^{(c)}}{2} + \frac{\sqrt{2}i Y_{10,7}^{(s)}}{2} \tag{1806a}$$

$$\frac{\sqrt{2}i Y_{10,3}^{(c)}}{2} - \frac{\sqrt{2} Y_{10,3}^{(s)}}{2} \tag{1807a}$$

$$-\frac{\sqrt{2}i Y_{10,9}^{(c)}}{2} - \frac{\sqrt{2} Y_{10,9}^{(s)}}{2} \tag{1808a}$$

11.6.6 $\Gamma^6 : l = 12$

$$-\frac{\sqrt{2}i Y_{12,9}^{(c)}}{2} - \frac{\sqrt{2} Y_{12,9}^{(s)}}{2} \tag{1809a}$$

$$\frac{\sqrt{2} Y_{12,5}^{(c)}}{2} - \frac{\sqrt{2}i Y_{12,5}^{(s)}}{2} \tag{1810a}$$

$$-\frac{\sqrt{2}i Y_{12,1}^{(c)}}{2} - \frac{\sqrt{2} Y_{12,1}^{(s)}}{2} \tag{1811a}$$

$$\frac{\sqrt{2} Y_{12,3}^{(c)}}{2} + \frac{\sqrt{2}i Y_{12,3}^{(s)}}{2} \tag{1812a}$$

$$\frac{\sqrt{2} Y_{12,11}^{(c)}}{2} + \frac{\sqrt{2}i Y_{12,11}^{(s)}}{2} \tag{1813a}$$

$$\frac{\sqrt{2} Y_{12,7}^{(c)}}{2} + \frac{\sqrt{2}i Y_{12,7}^{(s)}}{2} \tag{1814a}$$

11.7 Γ^7

11.7.1 $\Gamma^7 : l = 2$

$$\frac{\sqrt{2} Y_{2,1}^{(c)}}{2} + \frac{\sqrt{2}i Y_{2,1}^{(s)}}{2} \tag{1815a}$$

11.7.2 $\Gamma^7 : l = 4$

$$\frac{\sqrt{2} Y_{4,3}^{(c)}}{2} - \frac{\sqrt{2}i Y_{4,3}^{(s)}}{2} \tag{1816a}$$

$$\frac{\sqrt{2} Y_{4,1}^{(c)}}{2} - \frac{\sqrt{2} Y_{4,1}^{(s)}}{2} \tag{1817a}$$

11.7.3 $\Gamma^7 : l = 6$

$$\frac{\sqrt{2}i Y_{6,5}^{(c)}}{2} - \frac{\sqrt{2} Y_{6,5}^{(s)}}{2} \tag{1818a}$$

$$-\frac{\sqrt{2}i Y_{6,3}^{(c)}}{2} - \frac{\sqrt{2} Y_{6,3}^{(s)}}{2} \tag{1819a}$$

$$\frac{\sqrt{2}i Y_{6,1}^{(c)}}{2} - \frac{\sqrt{2} Y_{6,1}^{(s)}}{2} \tag{1820a}$$

11.7.4 $\Gamma^7 : l = 8$

$$\frac{\sqrt{2} Y_{8,5}^{(c)}}{2} + \frac{\sqrt{2}i Y_{8,5}^{(s)}}{2} \tag{1821a}$$

$$\frac{\sqrt{2} Y_{8,1}^{(c)}}{2} + \frac{\sqrt{2}i Y_{8,1}^{(s)}}{2} \tag{1822a}$$

$$\frac{\sqrt{2} Y_{8,7}^{(c)}}{2} - \frac{\sqrt{2}i Y_{8,7}^{(s)}}{2} \tag{1823a}$$

$$-\frac{\sqrt{2}i Y_{8,3}^{(c)}}{2} - \frac{\sqrt{2} Y_{8,3}^{(s)}}{2} \tag{1824a}$$

11.7.5 $\Gamma^7 : l = 10$

$$\frac{\sqrt{2} Y_{10,7}^{(c)}}{2} - \frac{\sqrt{2}i Y_{10,7}^{(s)}}{2} \tag{1825a}$$

$$\frac{\sqrt{2} Y_{10,9}^{(c)}}{2} + \frac{\sqrt{2}i Y_{10,9}^{(s)}}{2} \tag{1826a}$$

$$\frac{\sqrt{2} Y_{10,3}^{(c)}}{2} - \frac{\sqrt{2}i Y_{10,3}^{(s)}}{2} \tag{1827a}$$

$$\frac{\sqrt{2}i Y_{10,5}^{(c)}}{2} - \frac{\sqrt{2} Y_{10,5}^{(s)}}{2} \tag{1828a}$$

$$\frac{\sqrt{2} Y_{10,1}^{(c)}}{2} + \frac{\sqrt{2}i Y_{10,1}^{(s)}}{2} \tag{1829a}$$

11.7.6 $\Gamma^7 : l = 12$

$$\frac{\sqrt{2}i Y_{12,9}^{(c)}}{2} - \frac{\sqrt{2} Y_{12,9}^{(s)}}{2} \tag{1830a}$$

$$\frac{\sqrt{2} Y_{12,5}^{(c)}}{2} + \frac{\sqrt{2}i Y_{12,5}^{(s)}}{2} \tag{1831a}$$

$$\frac{\sqrt{2}i Y_{12,1}^{(c)}}{2} - \frac{\sqrt{2} Y_{12,1}^{(s)}}{2} \tag{1832a}$$

$$-\frac{\sqrt{2}i Y_{12,7}^{(c)}}{2} - \frac{\sqrt{2} Y_{12,7}^{(s)}}{2} \tag{1833a}$$

$$\frac{\sqrt{2} Y_{12,3}^{(c)}}{2} - \frac{\sqrt{2}i Y_{12,3}^{(s)}}{2} \tag{1834a}$$

$$\frac{\sqrt{2} Y_{12,11}^{(c)}}{2} - \frac{\sqrt{2}i Y_{12,11}^{(s)}}{2} \tag{1835a}$$

11.8 Γ^8

11.8.1 $\Gamma^8 : l = 2$

$$Y_{2,2}^{(c)} \tag{1836a}$$

$$-Y_{2,2}^{(s)} \tag{1837a}$$

11.8.2 $\Gamma^8 : l = 4$

$$Y_{4,2}^{(c)} \tag{1838a}$$

$$-Y_{4,2}^{(s)} \tag{1839a}$$

11.8.3 $\Gamma^8 : l = 6$

$$-Y_{6,6}^{(s)} \tag{1840a}$$

$$Y_{6,2}^{(c)} \tag{1841a}$$

$$-Y_{6,2}^{(s)} \tag{1842a}$$

$$Y_{6,6}^{(c)} \tag{1843a}$$

11.8.4 $\Gamma^8 : l = 8$

$$Y_{8,6}^{(c)} \tag{1844a}$$

$$Y_{8,2}^{(c)} \tag{1845a}$$

$$-Y_{8,2}^{(s)} \tag{1846a}$$

$$-Y_{8,6}^{(s)} \tag{1847a}$$

11.8.5 $\Gamma^8 : l = 10$

$$Y_{10,2}^{(c)} \tag{1848a}$$

$$-Y_{10,2}^{(s)} \tag{1849a}$$

$$-Y_{10,6}^{(s)} \tag{1850a}$$

$$Y_{10,6}^{(c)} \tag{1851a}$$

$$-Y_{10,10}^{(s)} \tag{1852a}$$

$$Y_{10,10}^{(c)} \tag{1853a}$$

11.8.6 $\Gamma^8 : l = 12$

$$Y_{12,10}^{(c)} \tag{1854a}$$

$$Y_{12,6}^{(c)} \tag{1855a}$$

$$-Y_{12,2}^{(s)} \tag{1856a}$$

$$-Y_{12,6}^{(s)} \tag{1857a}$$

$$-Y_{12,10}^{(s)} \tag{1858a}$$

$$Y_{12,2}^{(c)} \tag{1859a}$$

12 Group D_4

12.1 A_1

12.1.1 $A_1 : l = 0$

$$Y_{0,0}^{(c)}$$
(1860a)

12.1.2 $A_1 : l = 2$

$$\frac{Y_{2,0}^{(c)}}{2} + \frac{\sqrt{3}Y_{2,2}^{(c)}}{2}$$
(1861a)

12.1.3 $A_1 : l = 4$

$$\frac{\sqrt{35}Y_{4,0}^{(c)}}{12} + \frac{\sqrt{7}Y_{4,2}^{(c)}}{6} + \frac{3Y_{4,4}^{(c)}}{4}$$
(1862a)

$$\frac{2Y_{4,0}^{(c)}}{3} - \frac{\sqrt{5}Y_{4,2}^{(c)}}{3}$$
(1863a)

12.1.4 $A_1 : l = 5$

$$-\frac{\sqrt{3}Y_{5,2}^{(s)}}{2} + \frac{Y_{5,4}^{(s)}}{2}$$
(1864a)

12.1.5 $A_1 : l = 6$

$$\frac{\sqrt{14}Y_{6,0}^{(c)}}{8} + \frac{\sqrt{15}Y_{6,2}^{(c)}}{8} + \frac{\sqrt{2}Y_{6,4}^{(c)}}{8} + \frac{\sqrt{33}Y_{6,6}^{(c)}}{8}$$
(1865a)

$$\frac{\sqrt{2}Y_{6,0}^{(c)}}{4} - \frac{\sqrt{14}Y_{6,4}^{(c)}}{4}$$
(1866a)

12.1.6 $A_1 : l = 7$

$$\frac{\sqrt{22}Y_{7,2}^{(s)}}{8} + \frac{Y_{7,4}^{(s)}}{2} - \frac{\sqrt{26}Y_{7,6}^{(s)}}{8}$$
(1867a)

12.1.7 $A_1 : l = 8$

$$-\frac{\sqrt{286}Y_{8,0}^{(c)}}{64} + \frac{\sqrt{182}Y_{8,4}^{(c)}}{32} + \frac{\sqrt{3}Y_{8,6}^{(c)}}{2} + \frac{\sqrt{10}Y_{8,8}^{(c)}}{64}$$
(1868a)

$$-\frac{\sqrt{210}Y_{8,0}^{(c)}}{64} + \frac{\sqrt{3}Y_{8,2}^{(c)}}{2} - \frac{\sqrt{330}Y_{8,4}^{(c)}}{96} + \frac{\sqrt{6006}Y_{8,8}^{(c)}}{192}$$
(1869a)

$$\frac{\sqrt{33}Y_{8,0}^{(c)}}{8} + \frac{\sqrt{21}Y_{8,4}^{(c)}}{12} + \frac{\sqrt{195}Y_{8,8}^{(c)}}{24}$$
(1870a)

12.1.8 $A_1 : l = 9$

$$-\frac{\sqrt{39}Y_{9,2}^{(s)}}{8} + \frac{\sqrt{42}Y_{9,4}^{(s)}}{24} - \frac{3Y_{9,6}^{(s)}}{8} + \frac{\sqrt{102}Y_{9,8}^{(s)}}{24}$$
(1871a)

$$-\frac{\sqrt{102}Y_{9,4}^{(s)}}{12} + \frac{\sqrt{42}Y_{9,8}^{(s)}}{12}$$
(1872a)

12.1.9 $A_1 : l = 10$

$$\frac{3\sqrt{3213210}Y_{10,0}^{(c)}}{23968} + \frac{\sqrt{3628905}Y_{10,10}^{(c)}}{23968} - \frac{19\sqrt{19474}Y_{10,2}^{(c)}}{23968} - \frac{83\sqrt{1498}Y_{10,4}^{(c)}}{11984} + \frac{\sqrt{749}Y_{10,6}^{(c)}}{32} + \frac{31\sqrt{76398}Y_{10,8}^{(c)}}{23968}$$
(1873a)

$$-\frac{257\sqrt{850886926890}Y_{10,0}^{(c)}}{560024304} - \frac{13\sqrt{3325144305}Y_{10,10}^{(c)}}{35001519} - \frac{5\sqrt{5156890466}Y_{10,2}^{(c)}}{23334346} + \frac{2703\sqrt{396683882}Y_{10,4}^{(c)}}{93337384} + \frac{\sqrt{70003038}Y_{10,8}^{(c)}}{11984}$$
(1874a)

$$\frac{83\sqrt{46731}Y_{10,0}^{(c)}}{46731} + \frac{\sqrt{4316916318}Y_{10,10}^{(c)}}{93462} + \frac{17\sqrt{856735}Y_{10,2}^{(c)}}{31154} + \frac{3\sqrt{11137555}Y_{10,4}^{(c)}}{31154}$$
(1875a)

12.1.10 $A_1 : l = 11$

$$\frac{\sqrt{1938}Y_{11,10}^{(s)}}{64} - \frac{\sqrt{105}Y_{11,2}^{(s)}}{32} - \frac{Y_{11,4}^{(s)}}{2} - \frac{\sqrt{714}Y_{11,6}^{(s)}}{64}$$
(1876a)

$$\frac{\sqrt{70}Y_{11,10}^{(s)}}{64} - \frac{\sqrt{323}Y_{11,2}^{(s)}}{32} + \frac{3\sqrt{190}Y_{11,6}^{(s)}}{64} - \frac{Y_{11,8}^{(s)}}{2}$$
(1877a)

12.1.11 $A_1 : l = 12$

$$\frac{\sqrt{2510}Y_{12,0}^{(c)}}{64} - \frac{\sqrt{110664645}Y_{12,10}^{(c)}}{40160} + \frac{\sqrt{848428945}Y_{12,12}^{(c)}}{80320} - \frac{3\sqrt{7537530}Y_{12,2}^{(c)}}{40160} + \frac{3\sqrt{1256255}Y_{12,4}^{(c)}}{16064} - \frac{\sqrt{3050905}Y_{12,6}^{(c)}}{8032} + \frac{\sqrt{347803170}Y_{12,8}^{(c)}}{80320}$$
(1878a)

$$\frac{191\sqrt{88454372358}Y_{12,10}^{(c)}}{132776992} + \frac{15\sqrt{678150188078}Y_{12,12}^{(c)}}{66388496} - \frac{3737\sqrt{12447843}Y_{12,2}^{(c)}}{66388496} + \frac{\sqrt{8298562}Y_{12,4}^{(c)}}{4016} + \frac{927\sqrt{987528878}Y_{12,6}^{(c)}}{132776992} - \frac{21\sqrt{28144573023}Y_{12,8}^{(c)}}{8298562}$$
(1879a)

$$-\frac{12821\sqrt{18919646845}Y_{12,10}^{(c)}}{27519486320} + \frac{856\sqrt{1305455632305}Y_{12,12}^{(c)}}{1719967895} + \frac{\sqrt{1111099260170}Y_{12,2}^{(c)}}{1322480} + \frac{1079\sqrt{686267190105}Y_{12,6}^{(c)}}{5503897264} - \frac{1156\sqrt{24079550530}Y_{12,8}^{(c)}}{1719967895}$$
(1880a)

$$\frac{5\sqrt{20101494}Y_{12,10}^{(c)}}{41618} + \frac{4\sqrt{291326}Y_{12,12}^{(c)}}{20809} + \frac{\sqrt{200057726}Y_{12,6}^{(c)}}{41618} + \frac{4\sqrt{15794031}Y_{12,8}^{(c)}}{20809}$$
(1881a)

12.2 A_2

12.2.1 $A_2 : l = 1$

$$-Y_{1,1}^{(s)}$$

(1882a)

12.2.2 $A_2 : l = 3$

$$-\frac{\sqrt{6}Y_{3,1}^{(s)}}{4} - \frac{\sqrt{10}Y_{3,3}^{(s)}}{4}$$

(1883a)

12.2.3 $A_2 : l = 4$

$$-\frac{\sqrt{14}Y_{4,1}^{(c)}}{4} + \frac{\sqrt{2}Y_{4,3}^{(c)}}{4}$$

(1884a)

12.2.4 $A_2 : l = 5$

$$\frac{\sqrt{609}Y_{5,1}^{(s)}}{116} - \frac{\sqrt{58}Y_{5,3}^{(s)}}{8} - \frac{3\sqrt{290}Y_{5,5}^{(s)}}{232}$$

(1885a)

$$-\frac{\sqrt{435}Y_{5,1}^{(s)}}{29} - \frac{\sqrt{406}Y_{5,5}^{(s)}}{29}$$

(1886a)

12.2.5 $A_2 : l = 6$

$$\frac{\sqrt{3}Y_{6,1}^{(c)}}{4} + \frac{\sqrt{30}Y_{6,3}^{(c)}}{8} - \frac{\sqrt{22}Y_{6,5}^{(c)}}{8}$$

(1887a)

12.2.6 $A_2 : l = 7$

$$-\frac{\sqrt{2310}Y_{7,1}^{(s)}}{80} - \frac{\sqrt{770}Y_{7,3}^{(s)}}{80} - \frac{\sqrt{70}Y_{7,5}^{(s)}}{80} - \frac{\sqrt{130}Y_{7,7}^{(s)}}{16}$$

(1888a)

$$\frac{\sqrt{10}Y_{7,1}^{(s)}}{10} - \frac{\sqrt{30}Y_{7,3}^{(s)}}{20} - \frac{\sqrt{330}Y_{7,5}^{(s)}}{20}$$

(1889a)

12.2.7 $A_2 : l = 8$

$$-\frac{\sqrt{2310}Y_{8,1}^{(c)}}{144} + \frac{9\sqrt{2}Y_{8,3}^{(c)}}{16} + \frac{\sqrt{390}Y_{8,5}^{(c)}}{144} - \frac{\sqrt{546}Y_{8,7}^{(c)}}{48}$$

(1890a)

$$-\frac{\sqrt{858}Y_{8,1}^{(c)}}{36} - \frac{\sqrt{42}Y_{8,5}^{(c)}}{18} + \frac{\sqrt{30}Y_{8,7}^{(c)}}{12}$$

(1891a)

12.2.8 $A_2 : l = 9$

$$-\frac{3\sqrt{624767}Y_{9,1}^{(s)}}{4112} - \frac{\sqrt{2385474}Y_{9,3}^{(s)}}{4112} - \frac{3\sqrt{43690}Y_{9,5}^{(s)}}{4112} - \frac{3\sqrt{8738}Y_{9,7}^{(s)}}{8224} - \frac{\sqrt{514}Y_{9,9}^{(s)}}{32}$$

(1892a)

$$-\frac{13\sqrt{6832345}Y_{9,1}^{(s)}}{420452} + \frac{7\sqrt{3156543390}Y_{9,3}^{(s)}}{840904} - \frac{\sqrt{2312486}Y_{9,5}^{(s)}}{2056} - \frac{59\sqrt{11562430}Y_{9,7}^{(s)}}{420452}$$

(1893a)

$$\frac{\sqrt{31493}Y_{9,1}^{(s)}}{409} - \frac{5\sqrt{2454}Y_{9,3}^{(s)}}{409} - \frac{\sqrt{74438}Y_{9,7}^{(s)}}{409}$$

(1894a)

12.2.9 $A_2 : l = 10$

$$\frac{3\sqrt{62985}Y_{10,1}^{(c)}}{1520} + \frac{11\sqrt{3230}Y_{10,3}^{(c)}}{1520} - \frac{7\sqrt{646}Y_{10,5}^{(c)}}{304} + \frac{\sqrt{190}Y_{10,7}^{(c)}}{32} - \frac{7\sqrt{30}Y_{10,9}^{(c)}}{160}$$

(1895a)

$$\frac{\sqrt{1235}Y_{10,1}^{(c)}}{380} + \frac{13\sqrt{570}Y_{10,3}^{(c)}}{760} + \frac{9\sqrt{114}Y_{10,5}^{(c)}}{152} - \frac{\sqrt{170}Y_{10,9}^{(c)}}{20}$$

(1896a)

12.2.10 $A_2 : l = 11$

$$-\frac{\sqrt{1314610}Y_{11,11}^{(s)}}{2368} - \frac{\sqrt{16835}Y_{11,1}^{(s)}}{1184} - \frac{3\sqrt{37}Y_{11,3}^{(s)}}{32} - \frac{35\sqrt{7770}Y_{11,5}^{(s)}}{7104} + \frac{11\sqrt{8806}Y_{11,7}^{(s)}}{2368} - \frac{\sqrt{2509710}Y_{11,9}^{(s)}}{7104}$$

(1897a)

$$-\frac{\sqrt{2942885946}Y_{11,11}^{(s)}}{109224} - \frac{3\sqrt{4551}Y_{11,1}^{(s)}}{296} + \frac{125\sqrt{39442}Y_{11,5}^{(s)}}{109224} - \frac{7\sqrt{10057710}Y_{11,7}^{(s)}}{72816} + \frac{23\sqrt{12739766}Y_{11,9}^{(s)}}{218448}$$

(1898a)

$$-\frac{7\sqrt{861}Y_{11,11}^{(s)}}{1476} - \frac{\sqrt{145673}Y_{11,5}^{(s)}}{1476} - \frac{\sqrt{128535}Y_{11,7}^{(s)}}{492} - \frac{43\sqrt{451}Y_{11,9}^{(s)}}{1476}$$

(1899a)

12.2.11 $A_2 : l = 12$

$$-\frac{\sqrt{77276458}Y_{12,11}^{(c)}}{47552} + \frac{\sqrt{743}Y_{12,1}^{(c)}}{32} - \frac{15\sqrt{171633}Y_{12,3}^{(c)}}{23776} + \frac{5\sqrt{5835522}Y_{12,5}^{(c)}}{47552} - \frac{5\sqrt{5279758}Y_{12,7}^{(c)}}{47552} + \frac{\sqrt{110874918}Y_{12,9}^{(c)}}{47552}$$

(1900a)

$$\frac{\sqrt{7104478326}Y_{12,11}^{(c)}}{74882512} + \frac{503\sqrt{1511690711}Y_{12,3}^{(c)}}{37441256} - \frac{2355\sqrt{177845966}Y_{12,5}^{(c)}}{74882512} - \frac{1429\sqrt{196566594}Y_{12,7}^{(c)}}{37441256} + \frac{\sqrt{9360314}Y_{12,9}^{(c)}}{5944}$$

(1901a)

$$\frac{75\sqrt{207867}Y_{12,11}^{(c)}}{50392} - \frac{3\sqrt{93590542}Y_{12,3}^{(c)}}{50392} - \frac{11\sqrt{2752663}Y_{12,5}^{(c)}}{50392} - \frac{\sqrt{3042417}Y_{12,7}^{(c)}}{6299}$$

(1902a)

12.3 B_2

12.3.1 $B_2 : l = 2$

$$Y_{2,1}^{(c)}$$

(1903a)

12.3.2 $B_2 : l = 3$

$$\frac{\sqrt{10}Y_{3,1}^{(s)}}{4} - \frac{\sqrt{6}Y_{3,3}^{(s)}}{4}$$

(1904a)

12.3.3 $B_2 : l = 4$

$$\frac{\sqrt{2}Y_{4,1}^{(c)}}{4} + \frac{\sqrt{14}Y_{4,3}^{(c)}}{4}$$

(1905a)

12.3.4 $B_2 : l = 5$

$$\frac{\sqrt{7}Y_{5,1}^{(s)}}{4} + \frac{\sqrt{6}Y_{5,3}^{(s)}}{8} - \frac{\sqrt{30}Y_{5,5}^{(s)}}{8}$$

(1906a)

12.3.5 $B_2 : l = 6$

$$\frac{\sqrt{13}Y_{6,1}^{(c)}}{4} - \frac{3\sqrt{130}Y_{6,3}^{(c)}}{104} + \frac{\sqrt{858}Y_{6,5}^{(c)}}{104}$$

(1907a)

$$\frac{\sqrt{286}Y_{6,3}^{(c)}}{26} + \frac{\sqrt{390}Y_{6,5}^{(c)}}{26}$$

(1908a)

12.3.6 $B_2 : l = 7$

$$-\frac{5\sqrt{154}Y_{7,1}^{(s)}}{112} + \frac{11\sqrt{462}Y_{7,3}^{(s)}}{336} - \frac{\sqrt{42}Y_{7,5}^{(s)}}{16} + \frac{\sqrt{78}Y_{7,7}^{(s)}}{48}$$

(1909a)

$$-\frac{\sqrt{182}Y_{7,1}^{(s)}}{28} - \frac{\sqrt{546}Y_{7,3}^{(s)}}{42} + \frac{\sqrt{66}Y_{7,7}^{(s)}}{12}$$

(1910a)

12.3.7 $B_2 : l = 8$

$$\frac{\sqrt{101530}Y_{8,1}^{(c)}}{1136} + \frac{3\sqrt{38766}Y_{8,3}^{(c)}}{1136} + \frac{5\sqrt{4970}Y_{8,5}^{(c)}}{1136} + \frac{\sqrt{142}Y_{8,7}^{(c)}}{16}$$

(1911a)

$$\frac{\sqrt{2982}Y_{8,1}^{(c)}}{142} + \frac{\sqrt{7810}Y_{8,3}^{(c)}}{284} - \frac{\sqrt{60918}Y_{8,5}^{(c)}}{284}$$

(1912a)

12.3.8 $B_2 : l = 9$

$$-\frac{11Y_{9,1}^{(s)}}{16} - \frac{\sqrt{462}Y_{9,3}^{(s)}}{176} + \frac{\sqrt{1430}Y_{9,5}^{(s)}}{176} - \frac{7\sqrt{286}Y_{9,7}^{(s)}}{352} + \frac{3\sqrt{4862}Y_{9,9}^{(s)}}{352}$$

(1913a)

$$-\frac{\sqrt{2002}Y_{9,3}^{(s)}}{88} - \frac{3\sqrt{330}Y_{9,5}^{(s)}}{88} + \frac{5\sqrt{66}Y_{9,7}^{(s)}}{88} + \frac{\sqrt{1122}Y_{9,9}^{(s)}}{88}$$

(1914a)

12.3.9 $B_2 : l = 10$

$$\frac{3\sqrt{715}Y_{10,1}^{(c)}}{176} - \frac{\sqrt{330}Y_{10,3}^{(c)}}{528} + \frac{\sqrt{66}Y_{10,5}^{(c)}}{16} + \frac{7\sqrt{5610}Y_{10,7}^{(c)}}{1056} + \frac{\sqrt{35530}Y_{10,9}^{(c)}}{352}$$

(1915a)

$$-\frac{51\sqrt{5831969}Y_{10,1}^{(c)}}{211112} - \frac{41\sqrt{2691678}Y_{10,3}^{(c)}}{316668} + \frac{\sqrt{158334}Y_{10,7}^{(c)}}{528} - \frac{91\sqrt{1002782}Y_{10,9}^{(c)}}{422224}$$

(1916a)

$$-\frac{5\sqrt{45581}Y_{10,1}^{(c)}}{2399} + \frac{\sqrt{3555318}Y_{10,3}^{(c)}}{2399} + \frac{\sqrt{1060358}Y_{10,9}^{(c)}}{2399}$$

(1917a)

12.3.10 $B_2 : l = 11$

$$\frac{\sqrt{5574030}Y_{11,11}^{(s)}}{24384} + \frac{7\sqrt{421005}Y_{11,1}^{(s)}}{12192} - \frac{11\sqrt{45339}Y_{11,3}^{(s)}}{4064} - \frac{9\sqrt{21590}Y_{11,5}^{(s)}}{8128} - \frac{\sqrt{762}Y_{11,7}^{(s)}}{64} + \frac{29\sqrt{24130}Y_{11,9}^{(s)}}{8128}$$

(1918a)

$$\frac{13\sqrt{3392354658}Y_{11,11}^{(s)}}{1091184} - \frac{\sqrt{886587}Y_{11,1}^{(s)}}{1524} - \frac{29\sqrt{2386965}Y_{11,3}^{(s)}}{181864} - \frac{465\sqrt{45466}Y_{11,5}^{(s)}}{363728} - \frac{\sqrt{14685518}Y_{11,9}^{(s)}}{90932}$$

(1919a)

$$-\frac{3\sqrt{1969}Y_{11,11}^{(s)}}{1432} + \frac{\sqrt{578170}Y_{11,3}^{(s)}}{1432} - \frac{\sqrt{1214157}Y_{11,5}^{(s)}}{1432} + \frac{\sqrt{3759}Y_{11,9}^{(s)}}{179}$$

(1920a)

12.3.11 $B_2 : l = 12$

$$\frac{\sqrt{164255190}Y_{12,11}^{(c)}}{21440} + \frac{3\sqrt{77385}Y_{12,1}^{(c)}}{2144} + \frac{\sqrt{335}Y_{12,3}^{(c)}}{32} + \frac{27\sqrt{11390}Y_{12,5}^{(c)}}{21440} + \frac{\sqrt{4544610}Y_{12,7}^{(c)}}{21440} - \frac{17\sqrt{216410}Y_{12,9}^{(c)}}{21440}$$

(1921a)

$$\frac{29\sqrt{1332518110}Y_{12,11}^{(c)}}{3009640} - \frac{\sqrt{1336656365}Y_{12,1}^{(c)}}{601928} + \frac{49\sqrt{300211590}Y_{12,5}^{(c)}}{3009640} + \frac{3421\sqrt{752410}Y_{12,7}^{(c)}}{6019280} + \frac{\sqrt{15800610}Y_{12,9}^{(c)}}{5360}$$

(1922a)

$$-\frac{\sqrt{490751}Y_{12,11}^{(c)}}{4492} + \frac{3\sqrt{267274}Y_{12,1}^{(c)}}{4492} - \frac{17\sqrt{37059}Y_{12,5}^{(c)}}{4492} + \frac{\sqrt{1642949}Y_{12,7}^{(c)}}{2246}$$

(1923a)

12.4 B_1

12.4.1 $B_1 : l = 2$

$$-\frac{\sqrt{3}Y_{2,0}^{(c)}}{2} + \frac{Y_{2,2}^{(c)}}{2}$$

(1924a)

12.4.2 $B_1 : l = 3$

$$-Y_{3,2}^{(s)}$$

(1925a)

12.4.3 $B_1 : l = 4$

$$\frac{\sqrt{5}Y_{4,0}^{(c)}}{4} + \frac{Y_{4,2}^{(c)}}{2} - \frac{\sqrt{7}Y_{4,4}^{(c)}}{4} \tag{1926a}$$

12.4.4 $B_1 : l = 5$

$$-\frac{Y_{5,2}^{(s)}}{2} - \frac{\sqrt{3}Y_{5,4}^{(s)}}{2} \tag{1927a}$$

12.4.5 $B_1 : l = 6$

$$-\frac{\sqrt{210}Y_{6,0}^{(c)}}{56} + \frac{7Y_{6,2}^{(c)}}{8} - \frac{\sqrt{30}Y_{6,4}^{(c)}}{56} - \frac{3\sqrt{55}Y_{6,6}^{(c)}}{56} \tag{1928a}$$

$$\frac{\sqrt{462}Y_{6,0}^{(c)}}{28} + \frac{\sqrt{66}Y_{6,4}^{(c)}}{28} - \frac{4Y_{6,6}^{(c)}}{7} \tag{1929a}$$

12.4.6 $B_1 : l = 7$

$$-\frac{\sqrt{42}Y_{7,2}^{(s)}}{8} + \frac{\sqrt{231}Y_{7,4}^{(s)}}{42} - \frac{\sqrt{6006}Y_{7,6}^{(s)}}{168} \tag{1930a}$$

$$-\frac{\sqrt{273}Y_{7,4}^{(s)}}{21} - \frac{2\sqrt{42}Y_{7,6}^{(s)}}{21} \tag{1931a}$$

12.4.7 $B_1 : l = 8$

$$-\frac{3\sqrt{3157}Y_{8,0}^{(c)}}{656} + \frac{\sqrt{4510}Y_{8,2}^{(c)}}{328} + \frac{\sqrt{41}Y_{8,4}^{(c)}}{8} - \frac{\sqrt{22386}Y_{8,6}^{(c)}}{328} - \frac{\sqrt{18655}Y_{8,8}^{(c)}}{656} \tag{1932a}$$

$$-\frac{\sqrt{7995}Y_{8,0}^{(c)}}{164} - \frac{\sqrt{22386}Y_{8,2}^{(c)}}{328} - \frac{\sqrt{4510}Y_{8,6}^{(c)}}{328} + \frac{3\sqrt{1353}Y_{8,8}^{(c)}}{164} \tag{1933a}$$

12.4.8 $B_1 : l = 9$

$$-\frac{5Y_{9,2}^{(s)}}{8} - \frac{\sqrt{182}Y_{9,4}^{(s)}}{40} + \frac{3\sqrt{39}Y_{9,6}^{(s)}}{40} - \frac{\sqrt{442}Y_{9,8}^{(s)}}{40} \tag{1934a}$$

$$-\frac{\sqrt{42}Y_{9,4}^{(s)}}{20} - \frac{4Y_{9,6}^{(s)}}{5} - \frac{\sqrt{102}Y_{9,8}^{(s)}}{20} \tag{1935a}$$

12.4.9 $B_1 : l = 10$

$$\frac{\sqrt{4789070}Y_{10,0}^{(c)}}{6304} - \frac{\sqrt{18715}Y_{10,10}^{(c)}}{6304} + \frac{\sqrt{261222}Y_{10,2}^{(c)}}{6304} - \frac{11\sqrt{20094}Y_{10,4}^{(c)}}{3152} - \frac{31\sqrt{10047}Y_{10,6}^{(c)}}{6304} + \frac{\sqrt{394}Y_{10,8}^{(c)}}{32} \tag{1936a}$$

$$-\frac{25\sqrt{132208670}Y_{10,0}^{(c)}}{1201897} - \frac{49\sqrt{25233827515}Y_{10,10}^{(c)}}{19230352} + \frac{\sqrt{7211382}Y_{10,2}^{(c)}}{3152} - \frac{125\sqrt{93747966}Y_{10,4}^{(c)}}{7211382} + \frac{1331\sqrt{46873983}Y_{10,6}^{(c)}}{57691056} \tag{1937a}$$

$$-\frac{\sqrt{16576417}Y_{10,0}^{(c)}}{6101} + \frac{31\sqrt{207434}Y_{10,10}^{(c)}}{24404} - \frac{13\sqrt{1738785}Y_{10,4}^{(c)}}{36606} - \frac{\sqrt{3477570}Y_{10,6}^{(c)}}{73212} \tag{1938a}$$

12.4.10 $B_1 : l = 11$

$$-\frac{3\sqrt{58}Y_{11,10}^{(s)}}{32} - \frac{\sqrt{327845}Y_{11,2}^{(s)}}{1392} - \frac{\sqrt{28101}Y_{11,4}^{(s)}}{348} - \frac{3\sqrt{7714}Y_{11,6}^{(s)}}{928} - \frac{\sqrt{1015}Y_{11,8}^{(s)}}{348} \tag{1939a}$$

$$-\frac{\sqrt{46835}Y_{11,2}^{(s)}}{1102} + \frac{3\sqrt{196707}Y_{11,4}^{(s)}}{2204} - \frac{\sqrt{1102}Y_{11,6}^{(s)}}{58} - \frac{5\sqrt{145}Y_{11,8}^{(s)}}{116} \tag{1940a}$$

$$-\frac{8\sqrt{19}Y_{11,2}^{(s)}}{57} + \frac{\sqrt{1995}Y_{11,4}^{(s)}}{114} + \frac{\sqrt{17}Y_{11,8}^{(s)}}{6} \tag{1941a}$$

12.4.11 $B_1 : l = 12$

$$\frac{\sqrt{1586}Y_{12,0}^{(c)}}{64} + \frac{\sqrt{413763}Y_{12,10}^{(c)}}{1952} - \frac{\sqrt{3172183}Y_{12,12}^{(c)}}{3904} + \frac{3\sqrt{28182}Y_{12,2}^{(c)}}{1952} - \frac{15\sqrt{4697}Y_{12,4}^{(c)}}{3904} + \frac{5\sqrt{11407}Y_{12,6}^{(c)}}{1952} - \frac{\sqrt{1300398}Y_{12,8}^{(c)}}{3904} \tag{1942a}$$

$$-\frac{65\sqrt{215574}Y_{12,10}^{(c)}}{60512} + \frac{\sqrt{1652734}Y_{12,12}^{(c)}}{30256} - \frac{235\sqrt{1060851}Y_{12,2}^{(c)}}{998448} - \frac{19\sqrt{707234}Y_{12,4}^{(c)}}{332816} + \frac{3\sqrt{291214}Y_{12,6}^{(c)}}{1952} - \frac{\sqrt{8299599}Y_{12,8}^{(c)}}{124806} \tag{1943a}$$

$$-\frac{\sqrt{93}Y_{12,10}^{(c)}}{31} - \frac{5\sqrt{713}Y_{12,12}^{(c)}}{248} + \frac{\sqrt{660858}Y_{12,2}^{(c)}}{2046} + \frac{5\sqrt{110143}Y_{12,4}^{(c)}}{2728} + \frac{5\sqrt{14322}Y_{12,8}^{(c)}}{2046} \tag{1944a}$$

12.5 E

12.5.1 $E : l = 1$

$$Y_{1,0}^{(c)} \tag{1945a}$$

$$Y_{1,1}^{(c)} \tag{1945b}$$

12.5.2 $E : l = 2$

$$-Y_{2,2}^{(s)} \tag{1946a}$$

$$Y_{2,1}^{(s)} \tag{1946b}$$

12.5.3 $E : l = 3$

$$\frac{\sqrt{10}Y_{3,0}^{(c)}}{4} + \frac{\sqrt{6}Y_{3,2}^{(c)}}{4} \tag{1947a}$$

$$Y_{3,3}^{(c)} \tag{1947b}$$

$$-\frac{\sqrt{6}Y_{3,0}^{(c)}}{4} + \frac{\sqrt{10}Y_{3,2}^{(c)}}{4} \tag{1948a}$$

$$Y_{3,1}^{(c)} \tag{1948b}$$

12.5.4 $E : l = 4$

$$-Y_{4,2}^{(s)} \tag{1949a}$$

$$-\frac{\sqrt{2}Y_{4,1}^{(s)}}{4} + \frac{\sqrt{14}Y_{4,3}^{(s)}}{4} \tag{1949b}$$

$$-Y_{4,4}^{(s)} \tag{1950a}$$

$$\frac{\sqrt{14}Y_{4,1}^{(s)}}{4} + \frac{\sqrt{2}Y_{4,3}^{(s)}}{4} \tag{1950b}$$

12.5.5 $E : l = 5$

$$Y_{5,4}^{(c)} \tag{1951a}$$

$$\frac{\sqrt{21}Y_{5,1}^{(c)}}{8} + \frac{9\sqrt{2}Y_{5,3}^{(c)}}{16} + \frac{\sqrt{10}Y_{5,5}^{(c)}}{16} \tag{1951b}$$

$$\frac{\sqrt{861}Y_{5,0}^{(c)}}{41} + \frac{2\sqrt{205}Y_{5,2}^{(c)}}{41} \tag{1952a}$$

$$-\frac{\sqrt{1435}Y_{5,1}^{(c)}}{328} - \frac{3\sqrt{1230}Y_{5,3}^{(c)}}{656} + \frac{\sqrt{246}Y_{5,5}^{(c)}}{16} \tag{1952b}$$

$$\frac{2\sqrt{205}Y_{5,0}^{(c)}}{41} - \frac{\sqrt{861}Y_{5,2}^{(c)}}{41} \tag{1953a}$$

$$\frac{3\sqrt{123}Y_{5,1}^{(c)}}{41} - \frac{\sqrt{574}Y_{5,3}^{(c)}}{41} \tag{1953b}$$

12.5.6 $E : l = 6$

$$-Y_{6,6}^{(s)} \tag{1954a}$$

$$\frac{3\sqrt{22}Y_{6,1}^{(s)}}{16} + \frac{\sqrt{55}Y_{6,3}^{(s)}}{16} + \frac{\sqrt{3}Y_{6,5}^{(s)}}{16} \tag{1954b}$$

$$-\frac{3\sqrt{201}Y_{6,2}^{(s)}}{67} + \frac{2\sqrt{670}Y_{6,4}^{(s)}}{67} \tag{1955a}$$

$$\frac{11\sqrt{2010}Y_{6,1}^{(s)}}{1072} - \frac{\sqrt{201}Y_{6,3}^{(s)}}{16} + \frac{\sqrt{3685}Y_{6,5}^{(s)}}{1072} \tag{1955b}$$

$$-\frac{2\sqrt{670}Y_{6,2}^{(s)}}{67} - \frac{3\sqrt{201}Y_{6,4}^{(s)}}{67} \tag{1956a}$$

$$-\frac{\sqrt{67}Y_{6,1}^{(s)}}{67} + \frac{\sqrt{4422}Y_{6,5}^{(s)}}{67} \tag{1956b}$$

12.5.7 $E : l = 7$

$$Y_{7,4}^{(c)} \tag{1957a}$$

$$-\frac{3\sqrt{33}Y_{7,1}^{(c)}}{32} - \frac{\sqrt{11}Y_{7,3}^{(c)}}{32} + \frac{25Y_{7,5}^{(c)}}{32} + \frac{\sqrt{91}Y_{7,7}^{(c)}}{32} \tag{1957b}$$

$$-\frac{\sqrt{209}Y_{7,0}^{(c)}}{19} + \frac{\sqrt{8778}Y_{7,2}^{(c)}}{798} + \frac{5\sqrt{10374}Y_{7,6}^{(c)}}{798} \tag{1958a}$$

$$\frac{75\sqrt{1463}Y_{7,1}^{(c)}}{4256} + \frac{25\sqrt{4389}Y_{7,3}^{(c)}}{12768} + \frac{\sqrt{399}Y_{7,5}^{(c)}}{32} - \frac{25\sqrt{741}Y_{7,7}^{(c)}}{1824} \tag{1958b}$$

$$\frac{\sqrt{247}Y_{7,0}^{(c)}}{38} + \frac{53\sqrt{10374}Y_{7,2}^{(c)}}{6384} + \frac{23\sqrt{8778}Y_{7,6}^{(c)}}{6384} \tag{1959a}$$

$$\frac{3\sqrt{1729}Y_{7,1}^{(c)}}{266} + \frac{\sqrt{5187}Y_{7,3}^{(c)}}{798} + \frac{2\sqrt{627}Y_{7,7}^{(c)}}{57} \tag{1959b}$$

$$\frac{Y_{7,0}^{(c)}}{2} - \frac{9\sqrt{42}Y_{7,2}^{(c)}}{112} + \frac{\sqrt{6006}Y_{7,6}^{(c)}}{112} \tag{1960a}$$

$$-\frac{\sqrt{7}Y_{7,1}^{(c)}}{14} + \frac{3\sqrt{21}Y_{7,3}^{(c)}}{14} \tag{1960b}$$

12.5.8 $E : l = 8$

$$\frac{3\sqrt{66}Y_{8,2}^{(s)}}{64} - \frac{5\sqrt{15}Y_{8,4}^{(s)}}{32} + \frac{\sqrt{910}Y_{8,6}^{(s)}}{64} + \frac{\sqrt{273}Y_{8,8}^{(s)}}{32} \tag{1961a}$$

$$-Y_{8,3}^{(s)} \tag{1961b}$$

$$\frac{\sqrt{590590}Y_{8,2}^{(s)}}{3776} - \frac{25\sqrt{5369}Y_{8,4}^{(s)}}{5664} - \frac{3\sqrt{354}Y_{8,6}^{(s)}}{64} + \frac{91\sqrt{295}Y_{8,8}^{(s)}}{5664} \tag{1962a}$$

$$-\frac{\sqrt{8437}Y_{8,1}^{(s)}}{177} + \frac{7\sqrt{413}Y_{8,5}^{(s)}}{177} + \frac{\sqrt{295}Y_{8,7}^{(s)}}{59} \tag{1962b}$$

$$-\frac{4\sqrt{177}Y_{8,2}^{(s)}}{59} - \frac{5\sqrt{19470}Y_{8,4}^{(s)}}{2124} + \frac{\sqrt{354354}Y_{8,8}^{(s)}}{2124} \tag{1963a}$$

$$-\frac{5\sqrt{12390}Y_{8,1}^{(s)}}{2124} - \frac{\sqrt{253110}Y_{8,5}^{(s)}}{1062} + \frac{\sqrt{354354}Y_{8,7}^{(s)}}{708} \tag{1963b}$$

$$\frac{\sqrt{546}Y_{8,4}^{(s)}}{36} + \frac{5\sqrt{30}Y_{8,8}^{(s)}}{36} \tag{1964a}$$

$$-\frac{\sqrt{858}Y_{8,1}^{(s)}}{36} - \frac{\sqrt{42}Y_{8,5}^{(s)}}{18} - \frac{\sqrt{30}Y_{8,7}^{(s)}}{12} \tag{1964b}$$

12.5.9 $E: l = 9$

$$-\frac{3\sqrt{1430}Y_{9,0}^{(c)}}{256} - \frac{\sqrt{13}Y_{9,2}^{(c)}}{64} + \frac{23\sqrt{14}Y_{9,4}^{(c)}}{128} + \frac{21\sqrt{3}Y_{9,6}^{(c)}}{64} + \frac{7\sqrt{34}Y_{9,8}^{(c)}}{256}$$ (1965a)

$$Y_{9,7}^{(c)}$$ (1965b)

$$\frac{69\sqrt{10010}Y_{9,0}^{(c)}}{17152} + \frac{23\sqrt{91}Y_{9,2}^{(c)}}{4288} + \frac{67\sqrt{2}Y_{9,4}^{(c)}}{128} - \frac{483\sqrt{21}Y_{9,6}^{(c)}}{4288} - \frac{161\sqrt{238}Y_{9,8}^{(c)}}{17152}$$ (1966a)

$$\frac{\sqrt{2002}Y_{9,1}^{(c)}}{67} - \frac{2\sqrt{39}Y_{9,3}^{(c)}}{67} - \frac{6\sqrt{35}Y_{9,5}^{(c)}}{67} + \frac{3\sqrt{119}Y_{9,9}^{(c)}}{67}$$ (1966b)

$$-\frac{449\sqrt{204270}Y_{9,0}^{(c)}}{663568} + \frac{6883\sqrt{1857}Y_{9,2}^{(c)}}{663568} - \frac{2969\sqrt{8047}Y_{9,6}^{(c)}}{663568} + \frac{541\sqrt{820794}Y_{9,8}^{(c)}}{663568}$$ (1967a)

$$\frac{26\sqrt{40854}Y_{9,1}^{(c)}}{41473} + \frac{\sqrt{4333}Y_{9,3}^{(c)}}{67} - \frac{12\sqrt{120705}Y_{9,5}^{(c)}}{41473} + \frac{6\sqrt{410397}Y_{9,9}^{(c)}}{41473}$$ (1967b)

$$\frac{815\sqrt{11663885090}Y_{9,0}^{(c)}}{130505008} + \frac{6035\sqrt{106035319}Y_{9,2}^{(c)}}{130505008} + \frac{\sqrt{24469689}Y_{9,6}^{(c)}}{9904} + \frac{2057\sqrt{277323142}Y_{9,8}^{(c)}}{130505008}$$ (1968a)

$$-\frac{21\sqrt{2332777018}Y_{9,1}^{(c)}}{8156563} + \frac{745\sqrt{40782815}Y_{9,5}^{(c)}}{8156563} + \frac{556\sqrt{138661571}Y_{9,9}^{(c)}}{8156563}$$ (1968b)

$$-\frac{17\sqrt{224009}Y_{9,0}^{(c)}}{26354} + \frac{2\sqrt{24640990}Y_{9,2}^{(c)}}{13177} - \frac{5\sqrt{9421555}Y_{9,8}^{(c)}}{26354}$$ (1969a)

$$-\frac{9\sqrt{1120045}Y_{9,1}^{(c)}}{13177} - \frac{\sqrt{64066574}Y_{9,5}^{(c)}}{13177} + \frac{\sqrt{18843110}Y_{9,9}^{(c)}}{13177}$$ (1969b)

12.5.10 $E: l = 10$

$$-Y_{10,10}^{(s)}$$ (1970a)

$$\frac{\sqrt{41990}Y_{10,1}^{(s)}}{256} + \frac{\sqrt{4845}Y_{10,3}^{(s)}}{128} + \frac{\sqrt{969}Y_{10,5}^{(s)}}{128} + \frac{\sqrt{285}Y_{10,7}^{(s)}}{256} + \frac{\sqrt{5}Y_{10,9}^{(s)}}{256}$$ (1970b)

$$\frac{7\sqrt{70638}Y_{10,2}^{(s)}}{11773} - \frac{4\sqrt{918294}Y_{10,4}^{(s)}}{11773} + \frac{9\sqrt{459147}Y_{10,6}^{(s)}}{11773} - \frac{4\sqrt{5203666}Y_{10,8}^{(s)}}{11773}$$ (1971a)

$$-\frac{\sqrt{23546}Y_{10,1}^{(s)}}{256} + \frac{1615\sqrt{459147}Y_{10,3}^{(s)}}{1506944} + \frac{323\sqrt{2295735}Y_{10,5}^{(s)}}{1506944} + \frac{95\sqrt{7805499}Y_{10,7}^{(s)}}{3013888} + \frac{5\sqrt{49434827}Y_{10,9}^{(s)}}{3013888}$$ (1971b)

$$\frac{4103\sqrt{602094766}Y_{10,2}^{(s)}}{185259928} - \frac{35731\sqrt{46314982}Y_{10,4}^{(s)}}{370519856} + \frac{3175\sqrt{23157491}Y_{10,6}^{(s)}}{92629964} + \frac{541\sqrt{2362064082}Y_{10,8}^{(s)}}{52931408}$$ (1972a)

$$\frac{1938\sqrt{23157491}Y_{10,3}^{(s)}}{23157491} - \frac{\sqrt{115787455}Y_{10,5}^{(s)}}{11773} + \frac{57\sqrt{393677347}Y_{10,7}^{(s)}}{23157491} + \frac{\sqrt{22439608779}Y_{10,9}^{(s)}}{23157491}$$ (1972b)

$$-\frac{100\sqrt{1685359039}Y_{10,2}^{(s)}}{7626059} + \frac{41\sqrt{129643003}Y_{10,4}^{(s)}}{15252118} + \frac{356\sqrt{259286006}Y_{10,6}^{(s)}}{7626059} + \frac{173\sqrt{22878177}Y_{10,8}^{(s)}}{2178874}$$ (1973a)

$$\frac{57\sqrt{259286006}Y_{10,3}^{(s)}}{7626059} - \frac{\sqrt{15252118}Y_{10,7}^{(s)}}{3934} + \frac{\sqrt{869370726}Y_{10,9}^{(s)}}{15252118}$$ (1973b)

$$-\frac{61\sqrt{100802}Y_{10,2}^{(s)}}{31016} - \frac{479\sqrt{7754}Y_{10,4}^{(s)}}{62032} - \frac{93\sqrt{3877}Y_{10,6}^{(s)}}{15508} - \frac{9\sqrt{395454}Y_{10,8}^{(s)}}{62032}$$ (1974a)

$$-\frac{\sqrt{3877}Y_{10,3}^{(s)}}{3877} + \frac{2\sqrt{3756813}Y_{10,9}^{(s)}}{3877}$$ (1974b)

12.5.11 $E: l = 11$

$$Y_{11,2}^{(c)}$$ (1975a)

$$\frac{\sqrt{124355}Y_{11,11}^{(c)}}{512} + \frac{21\sqrt{130}Y_{11,1}^{(c)}}{512} - \frac{57\sqrt{14}Y_{11,3}^{(c)}}{512} + \frac{41\sqrt{15}Y_{11,5}^{(c)}}{512} - \frac{17\sqrt{17}Y_{11,7}^{(c)}}{512} - \frac{\sqrt{4845}Y_{11,9}^{(c)}}{512}$$ (1975b)

$$Y_{11,8}^{(c)}$$ (1976a)

$$\frac{\sqrt{385}Y_{11,11}^{(c)}}{512} - \frac{\sqrt{41990}Y_{11,1}^{(c)}}{512} - \frac{3\sqrt{4522}Y_{11,3}^{(c)}}{512} + \frac{3\sqrt{4845}Y_{11,5}^{(c)}}{512} + \frac{77\sqrt{19}Y_{11,7}^{(c)}}{512} + \frac{39\sqrt{15}Y_{11,9}^{(c)}}{512}$$ (1976b)

$$\frac{\sqrt{13210197}Y_{11,0}^{(c)}}{8798} + \frac{9\sqrt{2841754}Y_{11,10}^{(c)}}{17596} + \frac{11\sqrt{13197}Y_{11,4}^{(c)}}{4399} + \frac{\sqrt{1046962}Y_{11,6}^{(c)}}{17596}$$ (1977a)

$$\frac{105\sqrt{15629647}Y_{11,11}^{(c)}}{1126144} + \frac{57\sqrt{800618}Y_{11,1}^{(c)}}{1126144} + \frac{\sqrt{43990}Y_{11,3}^{(c)}}{256} + \frac{1311\sqrt{92379}Y_{11,5}^{(c)}}{1126144} + \frac{171\sqrt{2617405}Y_{11,7}^{(c)}}{1126144} + \frac{15\sqrt{29838417}Y_{11,9}^{(c)}}{1126144}$$ (1977b)

$$\frac{811\sqrt{2713798267335519}Y_{11,0}^{(c)}}{61552030922} - \frac{75209\sqrt{677072340142}Y_{11,10}^{(c)}}{123104061844} + \frac{811\sqrt{328041548798799}Y_{11,4}^{(c)}}{30776015461} + \frac{2853\sqrt{90050621238886}Y_{11,6}^{(c)}}{123104061844}$$ (1978a)

$$\frac{\sqrt{30776015461}Y_{11,11}^{(c)}}{281536} - \frac{14495\sqrt{199011872937938061}Y_{11,1}^{(c)}}{3939329979008} - \frac{23725\sqrt{2296290841591593}Y_{11,5}^{(c)}}{1969664989504} - \frac{9011\sqrt{225126553097215}Y_{11,7}^{(c)}}{3939329979008} + \frac{131615\sqrt{7109259571491}Y_{11,9}^{(c)}}{3939329979008}$$ (1978b)

$$\frac{2\sqrt{4383269979253}Y_{11,0}^{(c)}}{6996139} - \frac{28\sqrt{70274975181918234}Y_{11,10}^{(c)}}{398479089023} - \frac{49341\sqrt{362615971010093}Y_{11,4}^{(c)}}{398479089023} - \frac{5068\sqrt{528383272044498}Y_{11,6}^{(c)}}{398479089023}$$ (1979a)

$$\frac{15043\sqrt{2390874534138}Y_{11,1}^{(c)}}{3187832712184} - \frac{29349\sqrt{5180228157299}Y_{11,5}^{(c)}}{398479089023} + \frac{43237\sqrt{1320958180111245}Y_{11,7}^{(c)}}{3187832712184} - \frac{66533\sqrt{1673213694807577}Y_{11,9}^{(c)}}{3187832712184}$$ (1979b)

$$-\frac{\sqrt{45451686}Y_{11,10}^{(c)}}{113914} + \frac{8\sqrt{6777883}Y_{11,4}^{(c)}}{56957} - \frac{181\sqrt{341742}Y_{11,6}^{(c)}}{113914}$$ (1980a)

$$-\frac{31\sqrt{75524982}Y_{11,1}^{(c)}}{455656} + \frac{29\sqrt{968269}Y_{11,5}^{(c)}}{56957} - \frac{245\sqrt{854355}Y_{11,7}^{(c)}}{455656} - \frac{171\sqrt{1082183}Y_{11,9}^{(c)}}{455656}$$ (1980b)

12.5.12 $E : l = 12$

$$\frac{25\sqrt{66}Y_{12,10}^{(s)}}{1024} + \frac{\sqrt{506}Y_{12,12}^{(s)}}{1024} - \frac{9\sqrt{969}Y_{12,2}^{(s)}}{512} - \frac{3\sqrt{646}Y_{12,4}^{(s)}}{1024} + \frac{37\sqrt{266}Y_{12,6}^{(s)}}{1024} + \frac{31\sqrt{21}Y_{12,8}^{(s)}}{256}$$

(1981a)

$$-Y_{12,9}^{(s)}$$

(1981b)

$$-\frac{\sqrt{1007326}Y_{12,10}^{(s)}}{1024} + \frac{275\sqrt{69505494}Y_{12,12}^{(s)}}{515750912} - \frac{675\sqrt{1789514639}Y_{12,2}^{(s)}}{257875456} - \frac{75\sqrt{10737087834}Y_{12,4}^{(s)}}{515750912} + \frac{925\sqrt{4421153814}Y_{12,6}^{(s)}}{515750912} + \frac{2325\sqrt{38782051}Y_{12,8}^{(s)}}{128937728}$$

(1982a)

$$\frac{5\sqrt{11584249}Y_{12,11}^{(s)}}{503663} - \frac{5\sqrt{2277564086}Y_{12,1}^{(s)}}{503663} + \frac{\sqrt{10737087834}Y_{12,3}^{(s)}}{503663} + \frac{19\sqrt{315796701}Y_{12,5}^{(s)}}{503663} + \frac{43\sqrt{38782051}Y_{12,7}^{(s)}}{503663}$$

(1982b)

$$-\frac{\sqrt{253548990830}Y_{12,12}^{(s)}}{503663} - \frac{9\sqrt{31079654972455155}Y_{12,2}^{(s)}}{126774495415} - \frac{3\sqrt{20719769981636770}Y_{12,4}^{(s)}}{253548990830} + \frac{37\sqrt{8531669992438670}Y_{12,6}^{(s)}}{253548990830} + \frac{62\sqrt{673552894139895}Y_{12,8}^{(s)}}{126774495415}$$

(1983a)

$$\frac{66911\sqrt{380323486245}Y_{12,11}^{(s)}}{16227135413120} + \frac{31393\sqrt{39555924510397470}Y_{12,1}^{(s)}}{8113567706560} + \frac{63061\sqrt{20719769981636770}Y_{12,3}^{(s)}}{16227135413120} + \frac{190833\sqrt{609404999459905}Y_{12,5}^{(s)}}{16227135413120} + \frac{16109\sqrt{673552894139895}Y_{12,7}^{(s)}}{4056783853280}$$

(1983b)

$$-\frac{6327\sqrt{3208284536345}Y_{12,2}^{(s)}}{26960374255} - \frac{703\sqrt{19249707218070}Y_{12,4}^{(s)}}{53920748510} - \frac{\sqrt{161762245530}Y_{12,6}^{(s)}}{503410} + \frac{16058\sqrt{512247110845}Y_{12,8}^{(s)}}{26960374255}$$

(1984a)

$$\frac{63509\sqrt{1714914240655}Y_{12,11}^{(s)}}{150040343680} - \frac{188687\sqrt{10083179971370}Y_{12,1}^{(s)}}{1725463952320} + \frac{514011\sqrt{19249707218070}Y_{12,3}^{(s)}}{3450927904640} - \frac{1091777\sqrt{566167859355}Y_{12,5}^{(s)}}{3450927904640} - \frac{358459\sqrt{512247110845}Y_{12,7}^{(s)}}{862731976160}$$

(1984b)

$$\frac{19073\sqrt{39353545399}Y_{12,2}^{(s)}}{5621935057} - \frac{67\sqrt{236121272394}Y_{12,4}^{(s)}}{77012809} + \frac{2532\sqrt{1815885023411}Y_{12,8}^{(s)}}{5621935057}$$

(1985a)

$$-\frac{1183\sqrt{6079267252289}Y_{12,11}^{(s)}}{15643645376} - \frac{45099\sqrt{123682571254}Y_{12,1}^{(s)}}{179901921824} - \frac{25713\sqrt{236121272394}Y_{12,3}^{(s)}}{359803843648} + \frac{147651\sqrt{2007030815349}Y_{12,5}^{(s)}}{359803843648} - \frac{\sqrt{1815885023411}Y_{12,7}^{(s)}}{1713776}$$

(1985b)

$$\frac{32\sqrt{157461}Y_{12,2}^{(s)}}{52487} + \frac{2\sqrt{104974}Y_{12,4}^{(s)}}{719} + \frac{\sqrt{356019321}Y_{12,8}^{(s)}}{52487}$$

(1986a)

$$-\frac{3\sqrt{12867555459}Y_{12,11}^{(s)}}{419896} - \frac{5\sqrt{24248994}Y_{12,1}^{(s)}}{104974} + \frac{603\sqrt{104974}Y_{12,3}^{(s)}}{419896} - \frac{119\sqrt{892279}Y_{12,5}^{(s)}}{419896}$$

(1986b)

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13   Group C_{4v}

13.1 A_1

13.1.1 $A_1 : l = 0$

$Y_{0,0}^{(c)}$ (1987a)

13.1.2 $A_1 : l = 1$

$Y_{1,0}^{(c)}$ (1988a)

13.1.3 $A_1 : l = 2$

$Y_{2,0}^{(c)}$ (1989a)

13.1.4 $A_1 : l = 3$

$Y_{3,0}^{(c)}$ (1990a)

13.1.5 $A_1 : l = 4$

$Y_{4,0}^{(c)}$ (1991a)

$Y_{4,4}^{(c)}$ (1992a)

13.1.6 $A_1 : l = 5$

$Y_{5,4}^{(c)}$ (1993a)

$Y_{5,0}^{(c)}$ (1994a)

13.1.7 $A_1 : l = 6$

$Y_{6,4}^{(c)}$ (1995a)

$Y_{6,0}^{(c)}$ (1996a)

13.1.8 $A_1 : l = 7$

$Y_{7,0}^{(c)}$ (1997a)

$Y_{7,4}^{(c)}$ (1998a)

13.1.9 $A_1 : l = 8$

$Y_{8,8}^{(c)}$ (1999a)

$Y_{8,0}^{(c)}$ (2000a)

$Y_{8,4}^{(c)}$ (2001a)

13.1.10 $A_1 : l = 9$

$Y_{9,0}^{(c)}$ (2002a)

$Y_{9,4}^{(c)}$ (2003a)

$Y_{9,8}^{(c)}$ (2004a)

13.1.11 $A_1 : l = 10$

$Y_{10,8}^{(c)}$ (2005a)

$Y_{10,4}^{(c)}$ (2006a)

$Y_{10,0}^{(c)}$ (2007a)

13.1.12 $A_1 : l = 11$

$Y_{11,8}^{(c)}$ (2008a)

$Y_{11,4}^{(c)}$ (2009a)

$Y_{11,0}^{(c)}$ (2010a)

13.1.13 $A_1 : l = 12$

$Y_{12,4}^{(c)}$ (2011a)

$Y_{12,8}^{(c)}$ (2012a)

$Y_{12,12}^{(c)}$ (2013a)

$Y_{12,0}^{(c)}$ (2014a)

13.2 A_2

13.2.1 $A_2 : l = 4$

$-Y_{4,4}^{(s)}$ (2015a)

13.2.2 $A_2 : l = 5$

$-Y_{5,4}^{(s)}$ (2016a)

13.2.3 $A_2 : l = 6$

$-Y_{6,4}^{(s)}$ (2017a)

13.2.4 $A_2 : l = 7$

$-Y_{7,4}^{(s)}$ (2018a)

13.2.5 $A_2 : l = 8$

$-Y_{8,8}^{(s)}$ (2019a)

$-Y_{8,4}^{(s)}$ (2020a)

13.2.6 $A_2 : l = 9$

$-Y_{9,4}^{(s)}$ (2021a)

$-Y_{9,8}^{(s)}$ (2022a)

13.2.7 $A_2 : l = 10$

$-Y_{10,8}^{(s)}$ (2023a)

$-Y_{10,4}^{(s)}$ (2024a)

13.2.8 $A_2 : l = 11$

$-Y_{11,4}^{(s)}$ (2025a)

$-Y_{11,8}^{(s)}$ (2026a)

13.2.9 $A_2 : l = 12$

$-Y_{12,4}^{(s)}$ (2027a)

$-Y_{12,8}^{(s)}$ (2028a)

$-Y_{12,12}^{(s)}$ (2029a)

13.3 B_2

13.3.1 $B_2 : l = 2$

$-Y_{2,2}^{(s)}$ (2030a)

13.3.2 $B_2 : l = 3$

$-Y_{3,2}^{(s)}$ (2031a)

13.3.3 $B_2 : l = 4$

$-Y_{4,2}^{(s)}$ (2032a)

13.3.4 $B_2 : l = 5$

$-Y_{5,2}^{(s)}$ (2033a)

13.3.5 $B_2 : l = 6$

$-Y_{6,6}^{(s)}$ (2034a)

$-Y_{6,2}^{(s)}$ (2035a)

13.3.6 $B_2 : l = 7$

$-Y_{7,2}^{(s)}$ (2036a)

$-Y_{7,6}^{(s)}$ (2037a)

13.3.7 $B_2 : l = 8$

$-Y_{8,2}^{(s)}$ (2038a)

$-Y_{8,6}^{(s)}$ (2039a)

13.3.8 $B_2 : l = 9$

$-Y_{9,2}^{(s)}$ (2040a)

$-Y_{9,6}^{(s)}$ (2041a)

13.3.9 $B_2 : l = 10$

$-Y_{10,2}^{(s)}$ (2042a)

$-Y_{10,6}^{(s)}$ (2043a)

$-Y_{10,10}^{(s)}$ (2044a)

13.3.10 $B_2 : l = 11$

$-Y_{11,10}^{(s)}$ (2045a)

$-Y_{11,6}^{(s)}$ (2046a)

$-Y_{11,2}^{(s)}$ (2047a)

13.3.11 $B_2 : l = 12$

$-Y_{12,10}^{(s)}$ (2048a)

$-Y_{12,2}^{(s)}$ (2049a)

$-Y_{12,6}^{(s)}$ (2050a)

13.4 B_1

13.4.1 $B_1 : l = 2$

$Y_{2,2}^{(c)}$ (2051a)

13.4.2 $B_1 : l = 3$

$Y_{3,2}^{(c)}$ (2052a)

13.4.3 $B_1 : l = 4$

$Y_{4,2}^{(c)}$ (2053a)

13.4.4 $B_1 : l = 5$

$Y_{5,2}^{(c)}$ (2054a)

13.4.5 $B_1 : l = 6$

$Y_{6,2}^{(c)}$ (2055a)

$Y_{6,6}^{(c)}$ (2056a)

13.4.6 $B_1 : l = 7$

$Y_{7,2}^{(c)}$ (2057a)

$Y_{7,6}^{(c)}$ (2058a)

13.4.7 $B_1 : l = 8$

$Y_{8,6}^{(c)}$ (2059a)

$Y_{8,2}^{(c)}$ (2060a)

13.4.8 $B_1 : l = 9$

$Y_{9,2}^{(c)}$	(2061a)
$Y_{9,6}^{(c)}$	(2062a)

13.4.9 $B_1 : l = 10$

$Y_{10,6}^{(c)}$	(2063a)
$Y_{10,2}^{(c)}$	(2064a)
$Y_{10,10}^{(c)}$	(2065a)

13.4.10 $B_1 : l = 11$

$Y_{11,6}^{(c)}$	(2066a)
$Y_{11,2}^{(c)}$	(2067a)
$Y_{11,10}^{(c)}$	(2068a)

13.4.11 $B_1 : l = 12$

$Y_{12,10}^{(c)}$	(2069a)
$Y_{12,2}^{(c)}$	(2070a)
$Y_{12,6}^{(c)}$	(2071a)

13.5 E

13.5.1 $E : l = 1$

$-Y_{1,1}^{(s)}$	(2072a)
$Y_{1,1}^{(c)}$	(2072b)

13.5.2 $E : l = 2$

$-Y_{2,1}^{(s)}$	(2073a)
$Y_{2,1}^{(c)}$	(2073b)

13.5.3 $E : l = 3$

$-Y_{3,1}^{(s)}$	(2074a)
$Y_{3,1}^{(c)}$	(2074b)
$-Y_{3,3}^{(s)}$	(2075a)
$-Y_{3,3}^{(c)}$	(2075b)

13.5.4 $E : l = 4$

$-Y_{4,1}^{(s)}$	(2076a)
$Y_{4,1}^{(c)}$	(2076b)
$Y_{4,3}^{(s)}$	(2077a)
$Y_{4,3}^{(c)}$	(2077b)

13.5.5 $E : l = 5$

$-Y_{5,5}^{(s)}$	(2078a)
$Y_{5,5}^{(c)}$	(2078b)
$-Y_{5,1}^{(s)}$	(2079a)
$Y_{5,1}^{(c)}$	(2079b)
$Y_{5,3}^{(s)}$	(2080a)
$Y_{5,3}^{(c)}$	(2080b)

13.5.6 $E : l = 6$

$-Y_{6,1}^{(s)}$	(2081a)
$Y_{6,1}^{(c)}$	(2081b)
$-Y_{6,3}^{(s)}$	(2082a)
$-Y_{6,3}^{(c)}$	(2082b)
$-Y_{6,5}^{(s)}$	(2083a)
$Y_{6,5}^{(c)}$	(2083b)

13.5.7 $E : l = 7$

$Y_{7,7}^{(s)}$	(2084a)
$Y_{7,7}^{(c)}$	(2084b)
$-Y_{7,3}^{(s)}$	(2085a)
$-Y_{7,3}^{(c)}$	(2085b)
$-Y_{7,5}^{(s)}$	(2086a)
$Y_{7,5}^{(c)}$	(2086b)
$-Y_{7,1}^{(s)}$	(2087a)
$Y_{7,1}^{(c)}$	(2087b)

13.5.8 $E : l = 8$

$-Y_{8,7}^{(s)}$	(2088a)
$-Y_{8,7}^{(c)}$	(2088b)
$-Y_{8,5}^{(s)}$	(2089a)
$Y_{8,5}^{(c)}$	(2089b)
$Y_{8,3}^{(s)}$	(2090a)
$Y_{8,3}^{(c)}$	(2090b)
$-Y_{8,1}^{(s)}$	(2091a)
$Y_{8,1}^{(c)}$	(2091b)

13.5.9 $E : l = 9$

$-Y_{9,9}^{(s)}$	(2092a)
$Y_{9,9}^{(c)}$	(2092b)
$-Y_{9,1}^{(s)}$	(2093a)
$Y_{9,1}^{(c)}$	(2093b)
$Y_{9,7}^{(s)}$	(2094a)
$Y_{9,7}^{(c)}$	(2094b)
$-Y_{9,5}^{(s)}$	(2095a)
$Y_{9,5}^{(c)}$	(2095b)
$-Y_{9,3}^{(s)}$	(2096a)
$-Y_{9,3}^{(c)}$	(2096b)

13.5.10 $E : l = 10$

$-Y_{10,7}^{(s)}$	(2097a)
$-Y_{10,7}^{(c)}$	(2097b)
$-Y_{10,5}^{(s)}$	(2098a)
$Y_{10,5}^{(c)}$	(2098b)
$-Y_{10,1}^{(s)}$	(2099a)
$Y_{10,1}^{(c)}$	(2099b)
$Y_{10,3}^{(s)}$	(2100a)
$Y_{10,3}^{(c)}$	(2100b)
$-Y_{10,9}^{(s)}$	(2101a)
$Y_{10,9}^{(c)}$	(2101b)

13.5.11 $E : l = 11$

$-Y_{11,5}^{(s)}$	(2102a)
$Y_{11,5}^{(c)}$	(2102b)
$-Y_{11,11}^{(s)}$	(2103a)
$-Y_{11,11}^{(c)}$	(2103b)
$Y_{11,3}^{(s)}$	(2104a)
$Y_{11,3}^{(c)}$	(2104b)
$-Y_{11,7}^{(s)}$	(2105a)
$-Y_{11,7}^{(c)}$	(2105b)
$-Y_{11,9}^{(s)}$	(2106a)
$Y_{11,9}^{(c)}$	(2106b)
$-Y_{11,1}^{(s)}$	(2107a)
$Y_{11,1}^{(c)}$	(2107b)

13.5.12 $E : l = 12$

$Y_{12,7}^{(s)}$	(2108a)
$Y_{12,7}^{(c)}$	(2108b)
$-Y_{12,3}^{(s)}$	(2109a)
$-Y_{12,3}^{(c)}$	(2109b)
$-Y_{12,5}^{(s)}$	(2110a)
$Y_{12,5}^{(c)}$	(2110b)
$Y_{12,11}^{(s)}$	(2111a)
$Y_{12,11}^{(c)}$	(2111b)
$-Y_{12,9}^{(s)}$	(2112a)
$Y_{12,9}^{(c)}$	(2112b)
$-Y_{12,1}^{(s)}$	(2113a)
$Y_{12,1}^{(c)}$	(2113b)

14 Group D_{2d}

14.1 A_1

14.1.1 $A_1 : l = 0$

$$Y_{0,0}^{(c)}$$

(2114a)

14.1.2 $A_1 : l = 2$

$$\frac{Y_{2,0}^{(c)}}{2} + \frac{\sqrt{3}Y_{2,2}^{(c)}}{2}$$

(2115a)

14.1.3 $A_1 : l = 3$

$$-Y_{3,2}^{(s)}$$

(2116a)

14.1.4 $A_1 : l = 4$

$$\frac{\sqrt{35}Y_{4,0}^{(c)}}{12} + \frac{\sqrt{7}Y_{4,2}^{(c)}}{6} + \frac{3Y_{4,4}^{(c)}}{4}$$

(2117a)

$$\frac{2Y_{4,0}^{(c)}}{3} - \frac{\sqrt{5}Y_{4,2}^{(c)}}{3}$$

(2118a)

14.1.5 $A_1 : l = 5$

$$-\frac{Y_{5,2}^{(s)}}{2} - \frac{\sqrt{3}Y_{5,4}^{(s)}}{2}$$

(2119a)

14.1.6 $A_1 : l = 6$

$$\frac{\sqrt{14}Y_{6,0}^{(c)}}{8} + \frac{\sqrt{15}Y_{6,2}^{(c)}}{8} + \frac{\sqrt{2}Y_{6,4}^{(c)}}{8} + \frac{\sqrt{33}Y_{6,6}^{(c)}}{8}$$

(2120a)

$$\frac{\sqrt{2}Y_{6,0}^{(c)}}{4} - \frac{\sqrt{14}Y_{6,4}^{(c)}}{4}$$

(2121a)

14.1.7 $A_1 : l = 7$

$$-\frac{\sqrt{42}Y_{7,2}^{(s)}}{8} + \frac{\sqrt{231}Y_{7,4}^{(s)}}{42} - \frac{\sqrt{6006}Y_{7,6}^{(s)}}{168}$$

(2122a)

$$-\frac{\sqrt{273}Y_{7,4}^{(s)}}{21} - \frac{2\sqrt{42}Y_{7,6}^{(s)}}{21}$$

(2123a)

14.1.8 $A_1 : l = 8$

$$-\frac{\sqrt{286}Y_{8,0}^{(c)}}{64} + \frac{\sqrt{182}Y_{8,4}^{(c)}}{32} + \frac{\sqrt{3}Y_{8,6}^{(c)}}{2} + \frac{\sqrt{10}Y_{8,8}^{(c)}}{64}$$

(2124a)

$$-\frac{\sqrt{210}Y_{8,0}^{(c)}}{64} + \frac{\sqrt{3}Y_{8,2}^{(c)}}{2} - \frac{\sqrt{330}Y_{8,4}^{(c)}}{96} + \frac{\sqrt{6006}Y_{8,8}^{(c)}}{192}$$

(2125a)

$$\frac{\sqrt{33}Y_{8,0}^{(c)}}{8} + \frac{\sqrt{21}Y_{8,4}^{(c)}}{12} + \frac{\sqrt{195}Y_{8,8}^{(c)}}{24}$$

(2126a)

14.1.9 $A_1 : l = 9$

$$-\frac{5Y_{9,2}^{(s)}}{8} - \frac{\sqrt{182}Y_{9,4}^{(s)}}{40} + \frac{3\sqrt{39}Y_{9,6}^{(s)}}{40} - \frac{\sqrt{442}Y_{9,8}^{(s)}}{40}$$

(2127a)

$$-\frac{\sqrt{42}Y_{9,4}^{(s)}}{20} - \frac{4Y_{9,6}^{(s)}}{5} - \frac{\sqrt{102}Y_{9,8}^{(s)}}{20}$$

(2128a)

14.1.10 $A_1 : l = 10$

$$\frac{3\sqrt{3213210}Y_{10,0}^{(c)}}{23968} + \frac{\sqrt{3628905}Y_{10,10}^{(c)}}{23968} - \frac{19\sqrt{19474}Y_{10,2}^{(c)}}{23968} - \frac{83\sqrt{1498}Y_{10,4}^{(c)}}{11984} + \frac{\sqrt{749}Y_{10,6}^{(c)}}{32} + \frac{31\sqrt{76398}Y_{10,8}^{(c)}}{23968}$$

(2129a)

$$-\frac{257\sqrt{850886926890}Y_{10,0}^{(c)}}{560024304} - \frac{13\sqrt{3325144305}Y_{10,10}^{(c)}}{35001519} - \frac{5\sqrt{5156890466}Y_{10,2}^{(c)}}{23334346} + \frac{2703\sqrt{396683882}Y_{10,4}^{(c)}}{93337384} + \frac{\sqrt{70003038}Y_{10,8}^{(c)}}{11984}$$

(2130a)

$$\frac{83\sqrt{46731}Y_{10,0}^{(c)}}{46731} + \frac{\sqrt{4316916318}Y_{10,10}^{(c)}}{93462} + \frac{17\sqrt{856735}Y_{10,2}^{(c)}}{31154} + \frac{3\sqrt{11137555}Y_{10,4}^{(c)}}{31154}$$

(2131a)

14.1.11 $A_1 : l = 11$

$$-\frac{3\sqrt{58}Y_{11,10}^{(s)}}{32} - \frac{\sqrt{327845}Y_{11,2}^{(s)}}{1392} - \frac{\sqrt{28101}Y_{11,4}^{(s)}}{348} - \frac{3\sqrt{7714}Y_{11,6}^{(s)}}{928} - \frac{\sqrt{1015}Y_{11,8}^{(s)}}{348}$$

(2132a)

$$-\frac{\sqrt{46835}Y_{11,2}^{(s)}}{1102} + \frac{3\sqrt{196707}Y_{11,4}^{(s)}}{2204} - \frac{\sqrt{1102}Y_{11,6}^{(s)}}{58} - \frac{5\sqrt{145}Y_{11,8}^{(s)}}{116}$$

(2133a)

$$-\frac{8\sqrt{19}Y_{11,2}^{(s)}}{57} + \frac{\sqrt{1995}Y_{11,4}^{(s)}}{114} + \frac{\sqrt{17}Y_{11,8}^{(s)}}{6}$$

(2134a)

14.1.12 $A_1 : l = 12$

$$\frac{\sqrt{2510}Y_{12,0}^{(c)}}{64} - \frac{\sqrt{110664645}Y_{12,10}^{(c)}}{40160} + \frac{\sqrt{848428945}Y_{12,12}^{(c)}}{80320} - \frac{3\sqrt{7537530}Y_{12,2}^{(c)}}{40160} + \frac{3\sqrt{1256255}Y_{12,4}^{(c)}}{16064} - \frac{\sqrt{3050905}Y_{12,6}^{(c)}}{8032} + \frac{\sqrt{347803170}Y_{12,8}^{(c)}}{80320}$$

(2135a)

$$\frac{191\sqrt{88454372358}Y_{12,10}^{(c)}}{132776992} + \frac{15\sqrt{678150188078}Y_{12,12}^{(c)}}{66388496} - \frac{3737\sqrt{12447843}Y_{12,2}^{(c)}}{66388496} + \frac{\sqrt{8298562}Y_{12,4}^{(c)}}{4016} + \frac{927\sqrt{987528878}Y_{12,6}^{(c)}}{132776992} - \frac{21\sqrt{28144573023}Y_{12,8}^{(c)}}{8298562}$$

(2136a)

$$-\frac{12821\sqrt{18919646845}Y_{12,10}^{(c)}}{27519486320} + \frac{856\sqrt{1305455632305}Y_{12,12}^{(c)}}{1719967895} + \frac{\sqrt{1111099260170}Y_{12,2}^{(c)}}{1322480} + \frac{1079\sqrt{686267190105}Y_{12,6}^{(c)}}{5503897264} - \frac{1156\sqrt{24079550530}Y_{12,8}^{(c)}}{1719967895}$$

(2137a)

$$\frac{5\sqrt{20101494}Y_{12,10}^{(c)}}{41618} + \frac{4\sqrt{291326}Y_{12,12}^{(c)}}{20809} + \frac{\sqrt{200057726}Y_{12,6}^{(c)}}{41618} + \frac{4\sqrt{15794031}Y_{12,8}^{(c)}}{20809}$$

(2138a)

14.2 B_1

14.2.1 $B_1 : l = 1$

$$-Y_{1,1}^{(s)}$$

(2139a)

14.2.2 $B_1 : l = 2$

$$Y_{2,1}^{(c)}$$

(2140a)

14.2.3 $B_1 : l = 3$

$$-\frac{\sqrt{6}Y_{3,1}^{(s)}}{4} - \frac{\sqrt{10}Y_{3,3}^{(s)}}{4}$$

(2141a)

14.2.4 $B_1 : l = 4$

$$\frac{\sqrt{2}Y_{4,1}^{(c)}}{4} + \frac{\sqrt{14}Y_{4,3}^{(c)}}{4}$$

(2142a)

14.2.5 $B_1 : l = 5$

$$\frac{\sqrt{609}Y_{5,1}^{(s)}}{116} - \frac{\sqrt{58}Y_{5,3}^{(s)}}{8} - \frac{3\sqrt{290}Y_{5,5}^{(s)}}{232}$$

(2143a)

$$-\frac{\sqrt{435}Y_{5,1}^{(s)}}{29} - \frac{\sqrt{406}Y_{5,5}^{(s)}}{29}$$

(2144a)

14.2.6 $B_1 : l = 6$

$$\frac{\sqrt{13}Y_{6,1}^{(c)}}{4} - \frac{3\sqrt{130}Y_{6,3}^{(c)}}{104} + \frac{\sqrt{858}Y_{6,5}^{(c)}}{104}$$

(2145a)

$$\frac{\sqrt{286}Y_{6,3}^{(c)}}{26} + \frac{\sqrt{390}Y_{6,5}^{(c)}}{26}$$

(2146a)

14.2.7 $B_1 : l = 7$

$$-\frac{\sqrt{2310}Y_{7,1}^{(s)}}{80} - \frac{\sqrt{770}Y_{7,3}^{(s)}}{80} - \frac{\sqrt{70}Y_{7,5}^{(s)}}{80} - \frac{\sqrt{130}Y_{7,7}^{(s)}}{16}$$

(2147a)

$$\frac{\sqrt{10}Y_{7,1}^{(s)}}{10} - \frac{\sqrt{30}Y_{7,3}^{(s)}}{20} - \frac{\sqrt{330}Y_{7,5}^{(s)}}{20}$$

(2148a)

14.2.8 $B_1 : l = 8$

$$\frac{\sqrt{101530}Y_{8,1}^{(c)}}{1136} + \frac{3\sqrt{38766}Y_{8,3}^{(c)}}{1136} + \frac{5\sqrt{4970}Y_{8,5}^{(c)}}{1136} + \frac{\sqrt{142}Y_{8,7}^{(c)}}{16}$$

(2149a)

$$\frac{\sqrt{2982}Y_{8,1}^{(c)}}{142} + \frac{\sqrt{7810}Y_{8,3}^{(c)}}{284} - \frac{\sqrt{60918}Y_{8,5}^{(c)}}{284}$$

(2150a)

14.2.9 $B_1 : l = 9$

$$-\frac{3\sqrt{624767}Y_{9,1}^{(s)}}{4112} - \frac{\sqrt{2385474}Y_{9,3}^{(s)}}{4112} - \frac{3\sqrt{43690}Y_{9,5}^{(s)}}{4112} - \frac{3\sqrt{8738}Y_{9,7}^{(s)}}{8224} - \frac{\sqrt{514}Y_{9,9}^{(s)}}{32}$$

(2151a)

$$-\frac{13\sqrt{6832345}Y_{9,1}^{(s)}}{420452} + \frac{7\sqrt{3156543390}Y_{9,3}^{(s)}}{840904} - \frac{\sqrt{2312486}Y_{9,5}^{(s)}}{2056} - \frac{59\sqrt{11562430}Y_{9,7}^{(s)}}{420452}$$

(2152a)

$$\frac{\sqrt{31493}Y_{9,1}^{(s)}}{409} - \frac{5\sqrt{2454}Y_{9,3}^{(s)}}{409} - \frac{\sqrt{74438}Y_{9,7}^{(s)}}{409}$$

(2153a)

14.2.10 $B_1 : l = 10$

$$\frac{3\sqrt{715}Y_{10,1}^{(c)}}{176} - \frac{\sqrt{330}Y_{10,3}^{(c)}}{528} + \frac{\sqrt{66}Y_{10,5}^{(c)}}{16} + \frac{7\sqrt{5610}Y_{10,7}^{(c)}}{1056} + \frac{\sqrt{35530}Y_{10,9}^{(c)}}{352}$$

(2154a)

$$-\frac{51\sqrt{5831969}Y_{10,1}^{(c)}}{211112} - \frac{41\sqrt{2691678}Y_{10,3}^{(c)}}{316668} + \frac{\sqrt{158334}Y_{10,7}^{(c)}}{528} - \frac{91\sqrt{1002782}Y_{10,9}^{(c)}}{422224}$$

(2155a)

$$-\frac{5\sqrt{45581}Y_{10,1}^{(c)}}{2399} + \frac{\sqrt{3555318}Y_{10,3}^{(c)}}{2399} + \frac{\sqrt{1060358}Y_{10,9}^{(c)}}{2399}$$

(2156a)

14.2.11 $B_1 : l = 11$

$$-\frac{\sqrt{1314610}Y_{11,11}^{(s)}}{2368} - \frac{\sqrt{16835}Y_{11,1}^{(s)}}{1184} - \frac{3\sqrt{37}Y_{11,3}^{(s)}}{32} - \frac{35\sqrt{7770}Y_{11,5}^{(s)}}{7104} + \frac{11\sqrt{8806}Y_{11,7}^{(s)}}{2368} - \frac{\sqrt{2509710}Y_{11,9}^{(s)}}{7104} \tag{2157a}$$

$$-\frac{\sqrt{2942885946}Y_{11,11}^{(s)}}{109224} - \frac{3\sqrt{4551}Y_{11,1}^{(s)}}{296} + \frac{125\sqrt{39442}Y_{11,5}^{(s)}}{109224} - \frac{7\sqrt{10057710}Y_{11,7}^{(s)}}{72816} + \frac{23\sqrt{12739766}Y_{11,9}^{(s)}}{218448} \tag{2158a}$$

$$-\frac{7\sqrt{861}Y_{11,11}^{(s)}}{1476} - \frac{\sqrt{145673}Y_{11,5}^{(s)}}{1476} - \frac{\sqrt{128535}Y_{11,7}^{(s)}}{492} - \frac{43\sqrt{451}Y_{11,9}^{(s)}}{1476} \tag{2159a}$$

14.2.12 $B_1 : l = 12$

$$\frac{\sqrt{164255190}Y_{12,11}^{(c)}}{21440} + \frac{3\sqrt{77385}Y_{12,1}^{(c)}}{2144} + \frac{\sqrt{335}Y_{12,3}^{(c)}}{32} + \frac{27\sqrt{11390}Y_{12,5}^{(c)}}{21440} + \frac{\sqrt{4544610}Y_{12,7}^{(c)}}{21440} - \frac{17\sqrt{216410}Y_{12,9}^{(c)}}{21440} \tag{2160a}$$

$$\frac{29\sqrt{1332518110}Y_{12,11}^{(c)}}{3009640} - \frac{\sqrt{1336656365}Y_{12,1}^{(c)}}{601928} + \frac{49\sqrt{300211590}Y_{12,5}^{(c)}}{3009640} + \frac{3421\sqrt{752410}Y_{12,7}^{(c)}}{6019280} + \frac{\sqrt{15800610}Y_{12,9}^{(c)}}{5360} \tag{2161a}$$

$$-\frac{\sqrt{490751}Y_{12,11}^{(c)}}{4492} + \frac{3\sqrt{267274}Y_{12,1}^{(c)}}{4492} - \frac{17\sqrt{37059}Y_{12,5}^{(c)}}{4492} + \frac{\sqrt{1642949}Y_{12,7}^{(c)}}{2246} \tag{2162a}$$

14.3 A_2

14.3.1 $A_2 : l = 3$

$$\frac{\sqrt{10}Y_{3,1}^{(s)}}{4} - \frac{\sqrt{6}Y_{3,3}^{(s)}}{4} \tag{2163a}$$

14.3.2 $A_2 : l = 4$

$$-\frac{\sqrt{14}Y_{4,1}^{(c)}}{4} + \frac{\sqrt{2}Y_{4,3}^{(c)}}{4} \tag{2164a}$$

14.3.3 $A_2 : l = 5$

$$\frac{\sqrt{7}Y_{5,1}^{(s)}}{4} + \frac{\sqrt{6}Y_{5,3}^{(s)}}{8} - \frac{\sqrt{30}Y_{5,5}^{(s)}}{8} \tag{2165a}$$

14.3.4 $A_2 : l = 6$

$$\frac{\sqrt{3}Y_{6,1}^{(c)}}{4} + \frac{\sqrt{30}Y_{6,3}^{(c)}}{8} - \frac{\sqrt{22}Y_{6,5}^{(c)}}{8} \tag{2166a}$$

14.3.5 $A_2 : l = 7$

$$-\frac{5\sqrt{154}Y_{7,1}^{(s)}}{112} + \frac{11\sqrt{462}Y_{7,3}^{(s)}}{336} - \frac{\sqrt{42}Y_{7,5}^{(s)}}{16} + \frac{\sqrt{78}Y_{7,7}^{(s)}}{48} \tag{2167a}$$

$$-\frac{\sqrt{182}Y_{7,1}^{(s)}}{28} - \frac{\sqrt{546}Y_{7,3}^{(s)}}{42} + \frac{\sqrt{66}Y_{7,7}^{(s)}}{12} \tag{2168a}$$

14.3.6 $A_2 : l = 8$

$$-\frac{\sqrt{2310}Y_{8,1}^{(c)}}{144} + \frac{9\sqrt{2}Y_{8,3}^{(c)}}{16} + \frac{\sqrt{390}Y_{8,5}^{(c)}}{144} - \frac{\sqrt{546}Y_{8,7}^{(c)}}{48} \tag{2169a}$$

$$-\frac{\sqrt{858}Y_{8,1}^{(c)}}{36} - \frac{\sqrt{42}Y_{8,5}^{(c)}}{18} + \frac{\sqrt{30}Y_{8,7}^{(c)}}{12} \tag{2170a}$$

14.3.7 $A_2 : l = 9$

$$-\frac{11Y_{9,1}^{(s)}}{16} - \frac{\sqrt{462}Y_{9,3}^{(s)}}{176} + \frac{\sqrt{1430}Y_{9,5}^{(s)}}{176} - \frac{7\sqrt{286}Y_{9,7}^{(s)}}{352} + \frac{3\sqrt{4862}Y_{9,9}^{(s)}}{352} \tag{2171a}$$

$$-\frac{\sqrt{2002}Y_{9,3}^{(s)}}{88} - \frac{3\sqrt{330}Y_{9,5}^{(s)}}{88} + \frac{5\sqrt{66}Y_{9,7}^{(s)}}{88} + \frac{\sqrt{1122}Y_{9,9}^{(s)}}{88} \tag{2172a}$$

14.3.8 $A_2 : l = 10$

$$\frac{3\sqrt{62985}Y_{10,1}^{(c)}}{1520} + \frac{11\sqrt{3230}Y_{10,3}^{(c)}}{1520} - \frac{7\sqrt{646}Y_{10,5}^{(c)}}{304} + \frac{\sqrt{190}Y_{10,7}^{(c)}}{32} - \frac{7\sqrt{30}Y_{10,9}^{(c)}}{160} \tag{2173a}$$

$$\frac{\sqrt{1235}Y_{10,1}^{(c)}}{380} + \frac{13\sqrt{570}Y_{10,3}^{(c)}}{760} + \frac{9\sqrt{114}Y_{10,5}^{(c)}}{152} - \frac{\sqrt{170}Y_{10,9}^{(c)}}{20} \tag{2174a}$$

14.3.9 $A_2 : l = 11$

$$\frac{\sqrt{5574030}Y_{11,11}^{(s)}}{24384} + \frac{7\sqrt{421005}Y_{11,1}^{(s)}}{12192} - \frac{11\sqrt{45339}Y_{11,3}^{(s)}}{4064} - \frac{9\sqrt{21590}Y_{11,5}^{(s)}}{8128} - \frac{\sqrt{762}Y_{11,7}^{(s)}}{64} + \frac{29\sqrt{24130}Y_{11,9}^{(s)}}{8128} \tag{2175a}$$

$$\frac{13\sqrt{3392354658}Y_{11,11}^{(s)}}{1091184} - \frac{\sqrt{886587}Y_{11,1}^{(s)}}{1524} - \frac{29\sqrt{2386965}Y_{11,3}^{(s)}}{181864} - \frac{465\sqrt{45466}Y_{11,5}^{(s)}}{363728} - \frac{\sqrt{14685518}Y_{11,9}^{(s)}}{90932} \tag{2176a}$$

$$-\frac{3\sqrt{1969}Y_{11,11}^{(s)}}{1432} + \frac{\sqrt{578170}Y_{11,3}^{(s)}}{1432} - \frac{\sqrt{1214157}Y_{11,5}^{(s)}}{1432} + \frac{\sqrt{3759}Y_{11,9}^{(s)}}{179} \tag{2177a}$$

14.3.10 $A_2 : l = 12$

$$-\frac{\sqrt{77276458}Y_{12,11}^{(c)}}{47552} + \frac{\sqrt{743}Y_{12,1}^{(c)}}{32} - \frac{15\sqrt{171633}Y_{12,3}^{(c)}}{23776} + \frac{5\sqrt{5835522}Y_{12,5}^{(c)}}{47552} - \frac{5\sqrt{5279758}Y_{12,7}^{(c)}}{47552} + \frac{\sqrt{110874918}Y_{12,9}^{(c)}}{47552}$$

(2178a)

$$\frac{\sqrt{7104478326}Y_{12,11}^{(c)}}{74882512} + \frac{503\sqrt{1511690711}Y_{12,3}^{(c)}}{37441256} - \frac{2355\sqrt{177845966}Y_{12,5}^{(c)}}{74882512} - \frac{1429\sqrt{196566594}Y_{12,7}^{(c)}}{37441256} + \frac{\sqrt{9360314}Y_{12,9}^{(c)}}{5944}$$

(2179a)

$$\frac{75\sqrt{207867}Y_{12,11}^{(c)}}{50392} - \frac{3\sqrt{93590542}Y_{12,3}^{(c)}}{50392} - \frac{11\sqrt{2752663}Y_{12,5}^{(c)}}{50392} - \frac{\sqrt{3042417}Y_{12,7}^{(c)}}{6299}$$

(2180a)

14.4 B_2

14.4.1 $B_2 : l = 2$

$$-\frac{\sqrt{3}Y_{2,0}^{(c)}}{2} + \frac{Y_{2,2}^{(c)}}{2}$$

(2181a)

14.4.2 $B_2 : l = 4$

$$\frac{\sqrt{5}Y_{4,0}^{(c)}}{4} + \frac{Y_{4,2}^{(c)}}{2} - \frac{\sqrt{7}Y_{4,4}^{(c)}}{4}$$

(2182a)

14.4.3 $B_2 : l = 5$

$$-\frac{\sqrt{3}Y_{5,2}^{(s)}}{2} + \frac{Y_{5,4}^{(s)}}{2}$$

(2183a)

14.4.4 $B_2 : l = 6$

$$-\frac{\sqrt{210}Y_{6,0}^{(c)}}{56} + \frac{7Y_{6,2}^{(c)}}{8} - \frac{\sqrt{30}Y_{6,4}^{(c)}}{56} - \frac{3\sqrt{55}Y_{6,6}^{(c)}}{56}$$

(2184a)

$$\frac{\sqrt{462}Y_{6,0}^{(c)}}{28} + \frac{\sqrt{66}Y_{6,4}^{(c)}}{28} - \frac{4Y_{6,6}^{(c)}}{7}$$

(2185a)

14.4.5 $B_2 : l = 7$

$$\frac{\sqrt{22}Y_{7,2}^{(s)}}{8} + \frac{Y_{7,4}^{(s)}}{2} - \frac{\sqrt{26}Y_{7,6}^{(s)}}{8}$$

(2186a)

14.4.6 $B_2 : l = 8$

$$-\frac{3\sqrt{3157}Y_{8,0}^{(c)}}{656} + \frac{\sqrt{4510}Y_{8,2}^{(c)}}{328} + \frac{\sqrt{41}Y_{8,4}^{(c)}}{8} - \frac{\sqrt{22386}Y_{8,6}^{(c)}}{328} - \frac{\sqrt{18655}Y_{8,8}^{(c)}}{656}$$

(2187a)

$$-\frac{\sqrt{7995}Y_{8,0}^{(c)}}{164} - \frac{\sqrt{22386}Y_{8,2}^{(c)}}{328} - \frac{\sqrt{4510}Y_{8,6}^{(c)}}{328} + \frac{3\sqrt{1353}Y_{8,8}^{(c)}}{164}$$

(2188a)

14.4.7 $B_2 : l = 9$

$$-\frac{\sqrt{39}Y_{9,2}^{(s)}}{8} + \frac{\sqrt{42}Y_{9,4}^{(s)}}{24} - \frac{3Y_{9,6}^{(s)}}{8} + \frac{\sqrt{102}Y_{9,8}^{(s)}}{24}$$

(2189a)

$$-\frac{\sqrt{102}Y_{9,4}^{(s)}}{12} + \frac{\sqrt{42}Y_{9,8}^{(s)}}{12}$$

(2190a)

14.4.8 $B_2 : l = 10$

$$\frac{\sqrt{4789070}Y_{10,0}^{(c)}}{6304} - \frac{\sqrt{18715}Y_{10,10}^{(c)}}{6304} + \frac{\sqrt{261222}Y_{10,2}^{(c)}}{6304} - \frac{11\sqrt{20094}Y_{10,4}^{(c)}}{3152} - \frac{31\sqrt{10047}Y_{10,6}^{(c)}}{6304} + \frac{\sqrt{394}Y_{10,8}^{(c)}}{32}$$

(2191a)

$$-\frac{25\sqrt{132208670}Y_{10,0}^{(c)}}{1201897} - \frac{49\sqrt{25233827515}Y_{10,10}^{(c)}}{19230352} + \frac{\sqrt{7211382}Y_{10,2}^{(c)}}{3152} - \frac{125\sqrt{93747966}Y_{10,4}^{(c)}}{7211382} + \frac{1331\sqrt{46873983}Y_{10,6}^{(c)}}{57691056}$$

(2192a)

$$-\frac{\sqrt{16576417}Y_{10,0}^{(c)}}{6101} + \frac{31\sqrt{207434}Y_{10,10}^{(c)}}{24404} - \frac{13\sqrt{1738785}Y_{10,4}^{(c)}}{36606} - \frac{\sqrt{3477570}Y_{10,6}^{(c)}}{73212}$$

(2193a)

14.4.9 $B_2 : l = 11$

$$\frac{\sqrt{1938}Y_{11,10}^{(s)}}{64} - \frac{\sqrt{105}Y_{11,2}^{(s)}}{32} - \frac{Y_{11,4}^{(s)}}{2} - \frac{\sqrt{714}Y_{11,6}^{(s)}}{64}$$

(2194a)

$$\frac{\sqrt{70}Y_{11,10}^{(s)}}{64} - \frac{\sqrt{323}Y_{11,2}^{(s)}}{32} + \frac{3\sqrt{190}Y_{11,6}^{(s)}}{64} - \frac{Y_{11,8}^{(s)}}{2}$$

(2195a)

14.4.10 $B_2 : l = 12$

$$\frac{\sqrt{1586}Y_{12,0}^{(c)}}{64} + \frac{\sqrt{413763}Y_{12,10}^{(c)}}{1952} - \frac{\sqrt{3172183}Y_{12,12}^{(c)}}{3904} + \frac{3\sqrt{28182}Y_{12,2}^{(c)}}{1952} - \frac{15\sqrt{4697}Y_{12,4}^{(c)}}{3904} + \frac{5\sqrt{11407}Y_{12,6}^{(c)}}{1952} - \frac{\sqrt{1300398}Y_{12,8}^{(c)}}{3904}$$

(2196a)

$$-\frac{65\sqrt{215574}Y_{12,10}^{(c)}}{60512} + \frac{\sqrt{1652734}Y_{12,12}^{(c)}}{30256} - \frac{235\sqrt{1060851}Y_{12,2}^{(c)}}{998448} - \frac{19\sqrt{707234}Y_{12,4}^{(c)}}{332816} + \frac{3\sqrt{291214}Y_{12,6}^{(c)}}{1952} - \frac{\sqrt{8299599}Y_{12,8}^{(c)}}{124806}$$

(2197a)

$$-\frac{\sqrt{93}Y_{12,10}^{(c)}}{31} - \frac{5\sqrt{713}Y_{12,12}^{(c)}}{248} + \frac{\sqrt{660858}Y_{12,2}^{(c)}}{2046} + \frac{5\sqrt{110143}Y_{12,4}^{(c)}}{2728} + \frac{5\sqrt{14322}Y_{12,8}^{(c)}}{2046}$$

(2198a)

14.5 E

14.5.1 $E : l = 1$

$$Y_{1,0}^{(c)}$$

(2199a)

$$Y_{1,1}^{(c)}$$

(2199b)

14.5.2 $E : l = 2$

$$-Y_{2,2}^{(s)} \tag{2200a}$$

$$-Y_{2,1}^{(s)} \tag{2200b}$$

14.5.3 $E : l = 3$

$$\frac{\sqrt{10}Y_{3,0}^{(c)}}{4} + \frac{\sqrt{6}Y_{3,2}^{(c)}}{4} \tag{2201a}$$

$$Y_{3,3}^{(c)} \tag{2201b}$$

$$-\frac{\sqrt{6}Y_{3,0}^{(c)}}{4} + \frac{\sqrt{10}Y_{3,2}^{(c)}}{4} \tag{2202a}$$

$$Y_{3,1}^{(c)} \tag{2202b}$$

14.5.4 $E : l = 4$

$$-Y_{4,2}^{(s)} \tag{2203a}$$

$$\frac{\sqrt{2}Y_{4,1}^{(s)}}{4} - \frac{\sqrt{14}Y_{4,3}^{(s)}}{4} \tag{2203b}$$

$$-Y_{4,4}^{(s)} \tag{2204a}$$

$$-\frac{\sqrt{14}Y_{4,1}^{(s)}}{4} - \frac{\sqrt{2}Y_{4,3}^{(s)}}{4} \tag{2204b}$$

14.5.5 $E : l = 5$

$$Y_{5,4}^{(c)} \tag{2205a}$$

$$\frac{\sqrt{21}Y_{5,1}^{(c)}}{8} + \frac{9\sqrt{2}Y_{5,3}^{(c)}}{16} + \frac{\sqrt{10}Y_{5,5}^{(c)}}{16} \tag{2205b}$$

$$\frac{\sqrt{861}Y_{5,0}^{(c)}}{41} + \frac{2\sqrt{205}Y_{5,2}^{(c)}}{41} \tag{2206a}$$

$$-\frac{\sqrt{1435}Y_{5,1}^{(c)}}{328} - \frac{3\sqrt{1230}Y_{5,3}^{(c)}}{656} + \frac{\sqrt{246}Y_{5,5}^{(c)}}{16} \tag{2206b}$$

$$\frac{2\sqrt{205}Y_{5,0}^{(c)}}{41} - \frac{\sqrt{861}Y_{5,2}^{(c)}}{41} \tag{2207a}$$

$$\frac{3\sqrt{123}Y_{5,1}^{(c)}}{41} - \frac{\sqrt{574}Y_{5,3}^{(c)}}{41} \tag{2207b}$$

14.5.6 $E : l = 6$

$$-Y_{6,6}^{(s)} \tag{2208a}$$

$$-\frac{3\sqrt{22}Y_{6,1}^{(s)}}{16} - \frac{\sqrt{55}Y_{6,3}^{(s)}}{16} - \frac{\sqrt{3}Y_{6,5}^{(s)}}{16} \tag{2208b}$$

$$-\frac{\sqrt{345}Y_{6,2}^{(s)}}{23} - \frac{2\sqrt{46}Y_{6,4}^{(s)}}{23} \tag{2209a}$$

$$\frac{3\sqrt{138}Y_{6,1}^{(s)}}{368} + \frac{\sqrt{345}Y_{6,3}^{(s)}}{368} - \frac{\sqrt{253}Y_{6,5}^{(s)}}{16} \tag{2209b}$$

$$\frac{2\sqrt{46}Y_{6,2}^{(s)}}{23} - \frac{\sqrt{345}Y_{6,4}^{(s)}}{23} \tag{2210a}$$

$$\frac{\sqrt{115}Y_{6,1}^{(s)}}{23} - \frac{3\sqrt{46}Y_{6,3}^{(s)}}{23} \tag{2210b}$$

14.5.7 $E : l = 7$

$$Y_{7,4}^{(c)} \tag{2211a}$$

$$-\frac{3\sqrt{33}Y_{7,1}^{(c)}}{32} - \frac{\sqrt{11}Y_{7,3}^{(c)}}{32} + \frac{25Y_{7,5}^{(c)}}{32} + \frac{\sqrt{91}Y_{7,7}^{(c)}}{32} \tag{2211b}$$

$$-\frac{\sqrt{209}Y_{7,0}^{(c)}}{19} + \frac{\sqrt{8778}Y_{7,2}^{(c)}}{798} + \frac{5\sqrt{10374}Y_{7,6}^{(c)}}{798} \tag{2212a}$$

$$\frac{75\sqrt{1463}Y_{7,1}^{(c)}}{4256} + \frac{25\sqrt{4389}Y_{7,3}^{(c)}}{12768} + \frac{\sqrt{399}Y_{7,5}^{(c)}}{32} - \frac{25\sqrt{741}Y_{7,7}^{(c)}}{1824} \tag{2212b}$$

$$\frac{\sqrt{247}Y_{7,0}^{(c)}}{38} + \frac{53\sqrt{10374}Y_{7,2}^{(c)}}{6384} + \frac{23\sqrt{8778}Y_{7,6}^{(c)}}{6384} \tag{2213a}$$

$$\frac{3\sqrt{1729}Y_{7,1}^{(c)}}{266} + \frac{\sqrt{5187}Y_{7,3}^{(c)}}{798} + \frac{2\sqrt{627}Y_{7,7}^{(c)}}{57} \tag{2213b}$$

$$\frac{Y_{7,0}^{(c)}}{2} - \frac{9\sqrt{42}Y_{7,2}^{(c)}}{112} + \frac{\sqrt{6006}Y_{7,6}^{(c)}}{112} \tag{2214a}$$

$$-\frac{\sqrt{7}Y_{7,1}^{(c)}}{14} + \frac{3\sqrt{21}Y_{7,3}^{(c)}}{14} \tag{2214b}$$

14.5.8 $E : l = 8$

$$-Y_{8,2}^{(s)} \tag{2215a}$$

$$\frac{\sqrt{70}Y_{8,1}^{(s)}}{64} - \frac{3\sqrt{66}Y_{8,3}^{(s)}}{64} + \frac{\sqrt{1430}Y_{8,5}^{(s)}}{64} - \frac{\sqrt{2002}Y_{8,7}^{(s)}}{64} \tag{2215b}$$

$$\frac{5\sqrt{52530}Y_{8,4}^{(s)}}{1751} - \frac{\sqrt{796705}Y_{8,6}^{(s)}}{1751} - \frac{\sqrt{956046}Y_{8,8}^{(s)}}{1751} \tag{2216a}$$

$$-\frac{3\sqrt{4044810}Y_{8,1}^{(s)}}{112064} - \frac{\sqrt{3502}Y_{8,3}^{(s)}}{64} - \frac{33\sqrt{682890}Y_{8,5}^{(s)}}{112064} + \frac{33\sqrt{956046}Y_{8,7}^{(s)}}{112064} \tag{2216b}$$

$$-\frac{19\sqrt{478023}Y_{8,4}^{(s)}}{42024} + \frac{29\sqrt{3502}Y_{8,6}^{(s)}}{3502} - \frac{211\sqrt{26265}Y_{8,8}^{(s)}}{42024} \tag{2217a}$$

$$-\frac{2\sqrt{751179}Y_{8,1}^{(s)}}{1751} + \frac{5\sqrt{36771}Y_{8,5}^{(s)}}{10506} - \frac{7\sqrt{26265}Y_{8,7}^{(s)}}{10506} \tag{2217b}$$

$$-\frac{\sqrt{273}Y_{8,4}^{(s)}}{24} - \frac{\sqrt{2}Y_{8,6}^{(s)}}{2} - \frac{\sqrt{15}Y_{8,8}^{(s)}}{24} \tag{2218a}$$

$$-\frac{\sqrt{21}Y_{8,5}^{(s)}}{6} - \frac{\sqrt{15}Y_{8,7}^{(s)}}{6} \tag{2218b}$$

14.5.9 $E : l = 9$

$$-\frac{3\sqrt{1430}Y_{9,0}^{(c)}}{256} - \frac{\sqrt{13}Y_{9,2}^{(c)}}{64} + \frac{23\sqrt{14}Y_{9,4}^{(c)}}{128} + \frac{21\sqrt{3}Y_{9,6}^{(c)}}{64} + \frac{7\sqrt{34}Y_{9,8}^{(c)}}{256} \tag{2219a}$$

$$Y_{9,7}^{(c)} \tag{2219b}$$

$$\frac{69\sqrt{10010}Y_{9,0}^{(c)}}{17152} + \frac{23\sqrt{91}Y_{9,2}^{(c)}}{4288} + \frac{67\sqrt{2}Y_{9,4}^{(c)}}{128} - \frac{483\sqrt{21}Y_{9,6}^{(c)}}{4288} - \frac{161\sqrt{238}Y_{9,8}^{(c)}}{17152} \tag{2220a}$$

$$\frac{\sqrt{2002}Y_{9,1}^{(c)}}{67} - \frac{2\sqrt{39}Y_{9,3}^{(c)}}{67} - \frac{6\sqrt{35}Y_{9,5}^{(c)}}{67} + \frac{3\sqrt{119}Y_{9,9}^{(c)}}{67} \tag{2220b}$$

$$-\frac{449\sqrt{204270}Y_{9,0}^{(c)}}{663568} + \frac{6883\sqrt{1857}Y_{9,2}^{(c)}}{663568} - \frac{2969\sqrt{8047}Y_{9,6}^{(c)}}{663568} + \frac{541\sqrt{820794}Y_{9,8}^{(c)}}{663568} \tag{2221a}$$

$$\frac{26\sqrt{40854}Y_{9,1}^{(c)}}{41473} + \frac{\sqrt{4333}Y_{9,3}^{(c)}}{67} - \frac{12\sqrt{120705}Y_{9,5}^{(c)}}{41473} + \frac{6\sqrt{410397}Y_{9,9}^{(c)}}{41473} \tag{2221b}$$

$$\frac{815\sqrt{11663885090}Y_{9,0}^{(c)}}{130505008} + \frac{6035\sqrt{106035319}Y_{9,2}^{(c)}}{130505008} + \frac{\sqrt{24469689}Y_{9,6}^{(c)}}{9904} + \frac{2057\sqrt{277323142}Y_{9,8}^{(c)}}{130505008} \tag{2222a}$$

$$-\frac{21\sqrt{2332777018}Y_{9,1}^{(c)}}{8156563} + \frac{745\sqrt{40782815}Y_{9,5}^{(c)}}{8156563} + \frac{556\sqrt{138661571}Y_{9,9}^{(c)}}{8156563} \tag{2222b}$$

$$-\frac{17\sqrt{224009}Y_{9,0}^{(c)}}{26354} + \frac{2\sqrt{24640990}Y_{9,2}^{(c)}}{13177} - \frac{5\sqrt{9421555}Y_{9,8}^{(c)}}{26354} \tag{2223a}$$

$$-\frac{9\sqrt{1120045}Y_{9,1}^{(c)}}{13177} - \frac{\sqrt{64066574}Y_{9,5}^{(c)}}{13177} + \frac{\sqrt{18843110}Y_{9,9}^{(c)}}{13177} \tag{2223b}$$

14.5.10 $E : l = 10$

$$-\frac{\sqrt{5}Y_{10,10}^{(s)}}{256} - \frac{\sqrt{25194}Y_{10,2}^{(s)}}{256} - \frac{\sqrt{1938}Y_{10,4}^{(s)}}{64} - \frac{3\sqrt{969}Y_{10,6}^{(s)}}{256} - \frac{\sqrt{38}Y_{10,8}^{(s)}}{64} \tag{2224a}$$

$$-Y_{10,9}^{(s)} \tag{2224b}$$

$$-\frac{\sqrt{4845}Y_{10,10}^{(s)}}{128} + \frac{7\sqrt{26}Y_{10,2}^{(s)}}{128} - \frac{11\sqrt{2}Y_{10,4}^{(s)}}{32} + \frac{69Y_{10,6}^{(s)}}{128} - \frac{\sqrt{102}Y_{10,8}^{(s)}}{32} \tag{2225a}$$

$$-Y_{10,3}^{(s)} \tag{2225b}$$

$$\frac{45\sqrt{399}Y_{10,10}^{(s)}}{1792} + \frac{661\sqrt{15470}Y_{10,2}^{(s)}}{152320} - \frac{\sqrt{1190}Y_{10,4}^{(s)}}{64} - \frac{129\sqrt{595}Y_{10,6}^{(s)}}{152320} + \frac{9\sqrt{210}Y_{10,8}^{(s)}}{320} \tag{2226a}$$

$$\frac{\sqrt{46410}Y_{10,1}^{(s)}}{595} + \frac{10\sqrt{119}Y_{10,5}^{(s)}}{119} - \frac{\sqrt{35}Y_{10,7}^{(s)}}{35} \tag{2226b}$$

$$-\frac{10515\sqrt{560024031}Y_{10,10}^{(s)}}{628798912} + \frac{174621\sqrt{21713212430}Y_{10,2}^{(s)}}{53447907520} - \frac{\sqrt{835123555}Y_{10,6}^{(s)}}{38080} - \frac{309\sqrt{294749490}Y_{10,8}^{(s)}}{28071380} \tag{2227a}$$

$$-\frac{1371\sqrt{65139637290}Y_{10,1}^{(s)}}{835123555} - \frac{25\sqrt{167024711}Y_{10,5}^{(s)}}{167024711} - \frac{6364\sqrt{49124915}Y_{10,7}^{(s)}}{49124915} \tag{2227b}$$

$$\frac{29\sqrt{693363086}Y_{10,10}^{(s)}}{1403569} + \frac{9\sqrt{357910095}Y_{10,2}^{(s)}}{1403569} - \frac{122\sqrt{91231985}Y_{10,8}^{(s)}}{1403569} \tag{2228a}$$

$$\frac{107\sqrt{119303365}Y_{10,1}^{(s)}}{1403569} - \frac{13\sqrt{1861132494}Y_{10,5}^{(s)}}{1403569} - \frac{23\sqrt{547391910}Y_{10,7}^{(s)}}{1403569} \tag{2228b}$$

14.5.11 $E : l = 11$

$$Y_{11,2}^{(c)} \tag{2229a}$$

$$\frac{\sqrt{124355}Y_{11,11}^{(c)}}{512} + \frac{21\sqrt{130}Y_{11,1}^{(c)}}{512} - \frac{57\sqrt{14}Y_{11,3}^{(c)}}{512} + \frac{41\sqrt{15}Y_{11,5}^{(c)}}{512} - \frac{17\sqrt{17}Y_{11,7}^{(c)}}{512} - \frac{\sqrt{4845}Y_{11,9}^{(c)}}{512} \tag{2229b}$$

$$Y_{11,8}^{(c)} \tag{2230a}$$

$$\frac{\sqrt{385}Y_{11,11}^{(c)}}{512} - \frac{\sqrt{41990}Y_{11,1}^{(c)}}{512} - \frac{3\sqrt{4522}Y_{11,3}^{(c)}}{512} + \frac{3\sqrt{4845}Y_{11,5}^{(c)}}{512} + \frac{77\sqrt{19}Y_{11,7}^{(c)}}{512} + \frac{39\sqrt{15}Y_{11,9}^{(c)}}{512} \tag{2230b}$$

$$\frac{\sqrt{13210197}Y_{11,0}^{(c)}}{8798} + \frac{9\sqrt{2841754}Y_{11,10}^{(c)}}{17596} + \frac{11\sqrt{13197}Y_{11,4}^{(c)}}{4399} + \frac{\sqrt{1046962}Y_{11,6}^{(c)}}{17596} \tag{2231a}$$

$$\frac{105\sqrt{15629647}Y_{11,11}^{(c)}}{1126144} + \frac{57\sqrt{800618}Y_{11,1}^{(c)}}{1126144} + \frac{\sqrt{43990}Y_{11,3}^{(c)}}{256} + \frac{1311\sqrt{92379}Y_{11,5}^{(c)}}{1126144} + \frac{171\sqrt{2617405}Y_{11,7}^{(c)}}{1126144} + \frac{15\sqrt{29838417}Y_{11,9}^{(c)}}{1126144} \tag{2231b}$$

$$\frac{811\sqrt{2713798267335519}Y_{11,0}^{(c)}}{61552030922} - \frac{75209\sqrt{677072340142}Y_{11,10}^{(c)}}{123104061844} + \frac{811\sqrt{328041548798799}Y_{11,4}^{(c)}}{30776015461} + \frac{2853\sqrt{90050621238886}Y_{11,6}^{(c)}}{123104061844} \tag{2232a}$$

$$\frac{\sqrt{30776015461}Y_{11,11}^{(c)}}{281536} - \frac{14495\sqrt{19901187293793806}Y_{11,1}^{(c)}}{3939329979008} - \frac{23725\sqrt{2296290841591593}Y_{11,5}^{(c)}}{1969664989504} - \frac{9011\sqrt{225126553097215}Y_{11,7}^{(c)}}{3939329979008} + \frac{131615\sqrt{7109259571491}Y_{11,9}^{(c)}}{3939329979008} \tag{2232b}$$

$$\frac{2\sqrt{4383269979253}\,Y_{11,0}^{(c)}}{6996139} - \frac{28\sqrt{70274975181918234}\,Y_{11,10}^{(c)}}{398479089023} - \frac{49341\sqrt{36261597101093}\,Y_{11,4}^{(c)}}{398479089023} - \frac{5068\sqrt{528383272044498}\,Y_{11,6}^{(c)}}{398479089023} \tag{2233a}$$

$$\frac{15043\sqrt{2390874534138}\,Y_{11,1}^{(c)}}{3187832712184} - \frac{29349\sqrt{5180228157299}\,Y_{11,5}^{(c)}}{398479089023} + \frac{43237\sqrt{1320958180111245}\,Y_{11,7}^{(c)}}{3187832712184} - \frac{66533\sqrt{1673213694807577}\,Y_{11,9}^{(c)}}{3187832712184} \tag{2233b}$$

$$-\frac{\sqrt{45451686}\,Y_{11,10}^{(c)}}{113914} + \frac{8\sqrt{6777883}\,Y_{11,4}^{(c)}}{56957} - \frac{181\sqrt{341742}\,Y_{11,6}^{(c)}}{113914} \tag{2234a}$$

$$-\frac{31\sqrt{75524982}\,Y_{11,1}^{(c)}}{455656} + \frac{29\sqrt{968269}\,Y_{11,5}^{(c)}}{56957} - \frac{245\sqrt{854355}\,Y_{11,7}^{(c)}}{455656} - \frac{171\sqrt{1082183}\,Y_{11,9}^{(c)}}{455656} \tag{2234b}$$

14.5.12 $\quad E : l = 12$

$$-Y_{12,8}^{(s)} \tag{2235a}$$

$$-\frac{\sqrt{1771}\,Y_{12,11}^{(s)}}{256} - \frac{\sqrt{7106}\,Y_{12,1}^{(s)}}{256} + \frac{\sqrt{13566}\,Y_{12,3}^{(s)}}{256} + \frac{3\sqrt{399}\,Y_{12,5}^{(s)}}{256} - \frac{139\,Y_{12,7}^{(s)}}{256} - \frac{31\sqrt{21}\,Y_{12,9}^{(s)}}{256} \tag{2235b}$$

$$-Y_{12,12}^{(s)} \tag{2236a}$$

$$-\frac{\sqrt{6}\,Y_{12,11}^{(s)}}{1024} - \frac{\sqrt{156009}\,Y_{12,1}^{(s)}}{512} - \frac{\sqrt{81719}\,Y_{12,3}^{(s)}}{512} - \frac{3\sqrt{9614}\,Y_{12,5}^{(s)}}{1024} - \frac{\sqrt{10626}\,Y_{12,7}^{(s)}}{1024} - \frac{\sqrt{506}\,Y_{12,9}^{(s)}}{1024} \tag{2236b}$$

$$-\frac{43\sqrt{28059339}\,Y_{12,10}^{(s)}}{364407} - \frac{5\sqrt{1647848454}\,Y_{12,2}^{(s)}}{364407} + \frac{3\sqrt{274641409}\,Y_{12,4}^{(s)}}{121469} + \frac{29\sqrt{2307911}\,Y_{12,6}^{(s)}}{121469} \tag{2237a}$$

$$\frac{1115\sqrt{1290729594}\,Y_{12,11}^{(s)}}{373152768} + \frac{1595\sqrt{1294738071}\,Y_{12,1}^{(s)}}{186576384} - \frac{859\sqrt{274641409}\,Y_{12,3}^{(s)}}{62192128} - \frac{2577\sqrt{32310754}\,Y_{12,5}^{(s)}}{124384256} - \frac{\sqrt{728814}\,Y_{12,7}^{(s)}}{1024} + \frac{34725\sqrt{1700566}\,Y_{12,9}^{(s)}}{124384256} \tag{2237b}$$

$$-\frac{1247\sqrt{9485514210}\,Y_{12,10}^{(s)}}{499237590} - \frac{551\sqrt{46678714665}\,Y_{12,2}^{(s)}}{549161349} + \frac{1653\sqrt{31119143110}\,Y_{12,4}^{(s)}}{1830537830} - \frac{\sqrt{12813764810}\,Y_{12,6}^{(s)}}{121469} \tag{2238a}$$

$$-\frac{41509\sqrt{109083413415}\,Y_{12,11}^{(s)}}{31951205760} + \frac{4823\sqrt{59409273210}\,Y_{12,1}^{(s)}}{3195120576} - \frac{408387\sqrt{31119143110}\,Y_{12,3}^{(s)}}{117154421120} + \frac{961281\sqrt{915268915}\,Y_{12,5}^{(s)}}{117154421120} - \frac{108979\sqrt{17390109385}\,Y_{12,9}^{(s)}}{29288605280} \tag{2238b}$$

$$-\frac{43\sqrt{16146747390}\,Y_{12,10}^{(s)}}{16663310} - \frac{323\sqrt{274944615}\,Y_{12,2}^{(s)}}{18329641} - \frac{\sqrt{183296410}\,Y_{12,4}^{(s)}}{15070} \tag{2239a}$$

$$-\frac{1951\sqrt{185687594985}\,Y_{12,11}^{(s)}}{1066451840} + \frac{229\sqrt{349929510}\,Y_{12,1}^{(s)}}{106645184} + \frac{193797\sqrt{183296410}\,Y_{12,3}^{(s)}}{11730970240} - \frac{162983\sqrt{1558019485}\,Y_{12,5}^{(s)}}{11730970240} + \frac{2757\sqrt{29602370215}\,Y_{12,9}^{(s)}}{2932742560} \tag{2239b}$$

$$\frac{5\sqrt{23571894}\,Y_{12,10}^{(s)}}{36489} - \frac{43\sqrt{401379}\,Y_{12,2}^{(s)}}{36489} \tag{2240a}$$

$$-\frac{7\sqrt{271076781}\,Y_{12,11}^{(s)}}{291912} - \frac{13\sqrt{510846}\,Y_{12,1}^{(s)}}{36489} - \frac{5\sqrt{267586}\,Y_{12,3}^{(s)}}{97304} + \frac{45\sqrt{2274481}\,Y_{12,5}^{(s)}}{97304} + \frac{\sqrt{43215139}\,Y_{12,9}^{(s)}}{12163} \tag{2240b}$$

15   Group D_{4h}

15.1 A_{1g}

15.1.1 $A_{1g} : l = 0$

$$Y_{0,0}^{(c)} \quad (2241a)$$

15.1.2 $A_{1g} : l = 2$

$$Y_{2,0}^{(c)} \quad (2242a)$$

15.1.3 $A_{1g} : l = 4$

$$Y_{4,0}^{(c)} \quad (2243a)$$

$$Y_{4,4}^{(c)} \quad (2244a)$$

15.1.4 $A_{1g} : l = 6$

$$Y_{6,4}^{(c)} \quad (2245a)$$

$$Y_{6,0}^{(c)} \quad (2246a)$$

15.1.5 $A_{1g} : l = 8$

$$Y_{8,8}^{(c)} \quad (2247a)$$

$$Y_{8,0}^{(c)} \quad (2248a)$$

$$Y_{8,4}^{(c)} \quad (2249a)$$

15.1.6 $A_{1g} : l = 10$

$$Y_{10,8}^{(c)} \quad (2250a)$$

$$Y_{10,4}^{(c)} \quad (2251a)$$

$$Y_{10,0}^{(c)} \quad (2252a)$$

15.1.7 $A_{1g} : l = 12$

$$Y_{12,4}^{(c)} \quad (2253a)$$

$$Y_{12,8}^{(c)} \quad (2254a)$$

$$Y_{12,12}^{(c)} \quad (2255a)$$

$$Y_{12,0}^{(c)} \quad (2256a)$$

15.2 A_{2g}

15.2.1 $A_{2g} : l = 4$

$$-Y_{4,4}^{(s)} \quad (2257a)$$

15.2.2 $A_{2g} : l = 6$

$$-Y_{6,4}^{(s)} \quad (2258a)$$

15.2.3 $A_{2g} : l = 8$

$$-Y_{8,8}^{(s)} \quad (2259a)$$

$$-Y_{8,4}^{(s)} \quad (2260a)$$

15.2.4 $A_{2g} : l = 10$

$$-Y_{10,8}^{(s)} \quad (2261a)$$

$$-Y_{10,4}^{(s)} \quad (2262a)$$

15.2.5 $A_{2g} : l = 12$

$$-Y_{12,4}^{(s)} \quad (2263a)$$

$$-Y_{12,8}^{(s)} \quad (2264a)$$

$$-Y_{12,12}^{(s)} \quad (2265a)$$

15.3 B_{2g}

15.3.1 $B_{2g} : l = 2$

$$-Y_{2,2}^{(s)} \quad (2266a)$$

15.3.2 $B_{2g} : l = 4$

$$-Y_{4,2}^{(s)} \quad (2267a)$$

15.3.3 $B_{2g} : l = 6$

$$-Y_{6,6}^{(s)} \quad (2268a)$$

$$-Y_{6,2}^{(s)} \quad (2269a)$$

15.3.4 $B_{2g} : l = 8$

$$-Y_{8,2}^{(s)} \quad (2270a)$$

$$-Y_{8,6}^{(s)} \quad (2271a)$$

15.3.5 $B_{2g} : l = 10$

$$-Y_{10,2}^{(s)} \quad (2272a)$$

$$-Y_{10,6}^{(s)} \quad (2273a)$$

$$-Y_{10,10}^{(s)} \quad (2274a)$$

15.3.6 $B_{2g} : l = 12$

$$-Y_{12,10}^{(s)} \quad (2275a)$$

$$-Y_{12,2}^{(s)} \quad (2276a)$$

$$-Y_{12,6}^{(s)} \quad (2277a)$$

15.4 A_{2u}

15.4.1 $A_{2u} : l = 1$

$$Y_{1,0}^{(c)} \quad (2278a)$$

15.4.2 $A_{2u} : l = 3$

$$Y_{3,0}^{(c)} \quad (2279a)$$

15.4.3 $A_{2u} : l = 5$

$$Y_{5,4}^{(c)} \quad (2280a)$$

$$Y_{5,0}^{(c)} \quad (2281a)$$

15.4.4 $A_{2u} : l = 7$

$$Y_{7,0}^{(c)} \quad (2282a)$$

$$Y_{7,4}^{(c)} \quad (2283a)$$

15.4.5 $A_{2u} : l = 9$

$$Y_{9,0}^{(c)} \quad (2284a)$$

$$Y_{9,4}^{(c)} \quad (2285a)$$

$$Y_{9,8}^{(c)} \quad (2286a)$$

15.4.6 $A_{2u} : l = 11$

$$Y_{11,8}^{(c)} \quad (2287a)$$

$$Y_{11,4}^{(c)} \quad (2288a)$$

$$Y_{11,0}^{(c)} \quad (2289a)$$

15.5 B_{2u}

15.5.1 $B_{2u} : l = 3$

$$Y_{3,2}^{(c)} \quad (2290a)$$

15.5.2 $B_{2u} : l = 5$

$$Y_{5,2}^{(c)} \quad (2291a)$$

15.5.3 $B_{2u} : l = 7$

$$Y_{7,2}^{(c)} \quad (2292a)$$

$$Y_{7,6}^{(c)} \quad (2293a)$$

15.5.4 $B_{2u} : l = 9$

$$Y_{9,2}^{(c)} \quad (2294a)$$

$$Y_{9,6}^{(c)} \quad (2295a)$$

15.5.5 $B_{2u} : l = 11$

$$Y_{11,6}^{(c)} \quad (2296a)$$

$$Y_{11,2}^{(c)} \quad (2297a)$$

$$Y_{11,10}^{(c)} \quad (2298a)$$

15.6 B_{1u}

15.6.1 $B_{1u} : l = 3$

$$-Y_{3,2}^{(s)} \quad (2299a)$$

15.6.2 $B_{1u} : l = 5$

$$-Y_{5,2}^{(s)} \quad (2300a)$$

15.6.3 $B_{1u} : l = 7$

$$-Y_{7,2}^{(s)} \quad (2301a)$$

$$-Y_{7,6}^{(s)} \quad (2302a)$$

15.6.4 $B_{1u} : l = 9$

$$-Y_{9,2}^{(s)} \quad (2303a)$$

$$-Y_{9,6}^{(s)} \quad (2304a)$$

15.6.5 $B_{1u} : l = 11$

$$-Y_{11,10}^{(s)} \quad (2305a)$$

$$-Y_{11,6}^{(s)} \quad (2306a)$$

$$-Y_{11,2}^{(s)} \quad (2307a)$$

15.7 A_{1u}

15.7.1 $A_{1u} : l = 5$

$$-Y_{5,4}^{(s)} \quad (2308a)$$

15.7.2 $A_{1u} : l = 7$

$$-Y_{7,4}^{(s)} \quad (2309a)$$

15.7.3 $A_{1u} : l = 9$

$$-Y_{9,4}^{(s)} \quad (2310a)$$

$$-Y_{9,8}^{(s)} \quad (2311a)$$

15.7.4 $A_{1u} : l = 11$

$$-Y_{11,4}^{(s)} \quad (2312a)$$

$$-Y_{11,8}^{(s)} \quad (2313a)$$

15.8 B_{1g}

15.8.1 $B_{1g} : l = 2$

$$Y_{2,2}^{(c)} \quad (2314a)$$

15.8.2 $B_{1g} : l = 4$

$$Y_{4,2}^{(c)} \qquad (2315a)$$

15.8.3 $B_{1g} : l = 6$

$$Y_{6,2}^{(c)} \qquad (2316a)$$

$$Y_{6,6}^{(c)} \qquad (2317a)$$

15.8.4 $B_{1g} : l = 8$

$$Y_{8,6}^{(c)} \qquad (2318a)$$

$$Y_{8,2}^{(c)} \qquad (2319a)$$

15.8.5 $B_{1g} : l = 10$

$$Y_{10,6}^{(c)} \qquad (2320a)$$

$$Y_{10,2}^{(c)} \qquad (2321a)$$

$$Y_{10,10}^{(c)} \qquad (2322a)$$

15.8.6 $B_{1g} : l = 12$

$$Y_{12,10}^{(c)} \qquad (2323a)$$

$$Y_{12,2}^{(c)} \qquad (2324a)$$

$$Y_{12,6}^{(c)} \qquad (2325a)$$

15.9 E_u

15.9.1 $E_u : l = 1$

$$-Y_{1,1}^{(s)} \qquad (2326a)$$

$$Y_{1,1}^{(c)} \qquad (2326b)$$

15.9.2 $E_u : l = 3$

$$-Y_{3,1}^{(s)} \qquad (2327a)$$

$$Y_{3,1}^{(c)} \qquad (2327b)$$

$$-Y_{3,3}^{(s)} \qquad (2328a)$$

$$-Y_{3,3}^{(c)} \qquad (2328b)$$

15.9.3 $E_u : l = 5$

$$-Y_{5,5}^{(s)} \qquad (2329a)$$

$$Y_{5,5}^{(c)} \qquad (2329b)$$

$$-Y_{5,1}^{(s)} \qquad (2330a)$$

$$Y_{5,1}^{(c)} \qquad (2330b)$$

$$Y_{5,3}^{(s)} \qquad (2331a)$$

$$Y_{5,3}^{(c)} \qquad (2331b)$$

15.9.4 $E_u : l = 7$

$$Y_{7,7}^{(s)} \qquad (2332a)$$

$$Y_{7,7}^{(c)} \qquad (2332b)$$

$$-Y_{7,3}^{(s)} \qquad (2333a)$$

$$-Y_{7,3}^{(c)} \qquad (2333b)$$

$$-Y_{7,5}^{(s)} \qquad (2334a)$$

$$Y_{7,5}^{(c)} \qquad (2334b)$$

$$-Y_{7,1}^{(s)} \qquad (2335a)$$

$$Y_{7,1}^{(c)} \qquad (2335b)$$

15.9.5 $E_u : l = 9$

$$-Y_{9,9}^{(s)} \qquad (2336a)$$

$$Y_{9,9}^{(c)} \qquad (2336b)$$

$$-Y_{9,1}^{(s)} \qquad (2337a)$$

$$Y_{9,1}^{(c)} \qquad (2337b)$$

$$Y_{9,7}^{(s)} \qquad (2338a)$$

$$Y_{9,7}^{(c)} \qquad (2338b)$$

$$-Y_{9,5}^{(s)} \qquad (2339a)$$

$$Y_{9,5}^{(c)} \qquad (2339b)$$

$$-Y_{9,3}^{(s)} \qquad (2340a)$$

$$-Y_{9,3}^{(c)} \qquad (2340b)$$

15.9.6 $E_u : l = 11$

$$-Y_{11,5}^{(s)} \qquad (2341a)$$

$$Y_{11,5}^{(c)} \qquad (2341b)$$

$$-Y_{11,11}^{(s)} \qquad (2342a)$$

$$-Y_{11,11}^{(c)} \qquad (2342b)$$

$$Y_{11,3}^{(s)} \qquad (2343a)$$

$$Y_{11,3}^{(c)} \qquad (2343b)$$

$$-Y_{11,7}^{(s)} \qquad (2344a)$$

$$-Y_{11,7}^{(c)} \qquad (2344b)$$

$$-Y_{11,9}^{(s)} \qquad (2345a)$$

$$Y_{11,9}^{(c)} \qquad (2345b)$$

$$-Y_{11,1}^{(s)} \qquad (2346a)$$

$$Y_{11,1}^{(c)} \qquad (2346b)$$

15.10 E_g

15.10.1 $E_g : l = 2$

$$-Y_{2,1}^{(s)} \qquad (2347a)$$

$$Y_{2,1}^{(c)} \qquad (2347b)$$

15.10.2 $E_g : l = 4$

$$-Y_{4,1}^{(s)} \qquad (2348a)$$

$$Y_{4,1}^{(c)} \qquad (2348b)$$

$$Y_{4,3}^{(s)} \qquad (2349a)$$

$$Y_{4,3}^{(c)} \qquad (2349b)$$

15.10.3 $E_g : l = 6$

$$-Y_{6,1}^{(s)} \qquad (2350a)$$

$$Y_{6,1}^{(c)} \qquad (2350b)$$

$$-Y_{6,3}^{(s)} \qquad (2351a)$$

$$-Y_{6,3}^{(c)} \qquad (2351b)$$

$$-Y_{6,5}^{(s)} \qquad (2352a)$$

$$Y_{6,5}^{(c)} \qquad (2352b)$$

15.10.4 $E_g : l = 8$

$$-Y_{8,7}^{(s)} \qquad (2353a)$$

$$-Y_{8,7}^{(c)} \qquad (2353b)$$

$$-Y_{8,5}^{(s)} \qquad (2354a)$$

$$Y_{8,5}^{(c)} \qquad (2354b)$$

$$Y_{8,3}^{(s)} \qquad (2355a)$$

$$Y_{8,3}^{(c)} \qquad (2355b)$$

$$-Y_{8,1}^{(s)} \qquad (2356a)$$

$$Y_{8,1}^{(c)} \qquad (2356b)$$

15.10.5 $E_g : l = 10$

$$-Y_{10,7}^{(s)} \qquad (2357a)$$

$$-Y_{10,7}^{(c)} \qquad (2357b)$$

$$-Y_{10,5}^{(s)} \qquad (2358a)$$

$$Y_{10,5}^{(c)} \qquad (2358b)$$

$$-Y_{10,1}^{(s)} \qquad (2359a)$$

$$Y_{10,1}^{(c)} \qquad (2359b)$$

$$Y_{10,3}^{(s)} \qquad (2360a)$$

$$Y_{10,3}^{(c)} \qquad (2360b)$$

$$-Y_{10,9}^{(s)} \qquad (2361a)$$

$$Y_{10,9}^{(c)} \qquad (2361b)$$

15.10.6 $E_g : l = 12$

$$Y_{12,7}^{(s)} \qquad (2362a)$$

$$Y_{12,7}^{(c)} \qquad (2362b)$$

$$-Y_{12,3}^{(s)} \qquad (2363a)$$

$$-Y_{12,3}^{(c)} \qquad (2363b)$$

$$-Y_{12,5}^{(s)} \qquad (2364a)$$

$$Y_{12,5}^{(c)} \qquad (2364b)$$

$$Y_{12,11}^{(s)} \qquad (2365a)$$

$$Y_{12,11}^{(c)} \qquad (2365b)$$

$$-Y_{12,9}^{(s)} \qquad (2366a)$$

$$Y_{12,9}^{(c)} \qquad (2366b)$$

$$-Y_{12,1}^{(s)} \qquad (2367a)$$

$$Y_{12,1}^{(c)} \qquad (2367b)$$

16 Group C_3

16.1 A

16.1.1 $A : l = 0$

$$Y_{0,0}^{(c)}$$ (2368a)

16.1.2 $A : l = 1$

$$Y_{1,0}^{(c)}$$ (2369a)

16.1.3 $A : l = 2$

$$Y_{2,0}^{(c)}$$ (2370a)

16.1.4 $A : l = 3$

$$Y_{3,3}^{(c)}$$ (2371a)

$$-Y_{3,3}^{(s)}$$ (2372a)

$$Y_{3,0}^{(c)}$$ (2373a)

16.1.5 $A : l = 4$

$$Y_{4,0}^{(c)}$$ (2374a)

$$Y_{4,3}^{(c)}$$ (2375a)

$$-Y_{4,3}^{(s)}$$ (2376a)

16.1.6 $A : l = 5$

$$-Y_{5,3}^{(s)}$$ (2377a)

$$Y_{5,3}^{(c)}$$ (2378a)

$$Y_{5,0}^{(c)}$$ (2379a)

16.1.7 $A : l = 6$

$$-Y_{6,6}^{(s)}$$ (2380a)

$$Y_{6,6}^{(c)}$$ (2381a)

$$-Y_{6,3}^{(s)}$$ (2382a)

$$Y_{6,3}^{(c)}$$ (2383a)

$$Y_{6,0}^{(c)}$$ (2384a)

16.1.8 $A : l = 7$

$$Y_{7,6}^{(c)}$$ (2385a)

$$-Y_{7,3}^{(s)}$$ (2386a)

$$Y_{7,3}^{(c)}$$ (2387a)

$$-Y_{7,6}^{(s)}$$ (2388a)

$$Y_{7,0}^{(c)}$$ (2389a)

16.1.9 $A : l = 8$

$$Y_{8,6}^{(c)}$$ (2390a)

$$-Y_{8,6}^{(s)}$$ (2391a)

$$-Y_{8,3}^{(s)}$$ (2392a)

$$Y_{8,3}^{(c)}$$ (2393a)

$$Y_{8,0}^{(c)}$$ (2394a)

16.1.10 $A : l = 9$

$$-Y_{9,9}^{(s)}$$ (2395a)

$$-Y_{9,6}^{(s)}$$ (2396a)

$$Y_{9,0}^{(c)}$$ (2397a)

$$-Y_{9,3}^{(s)}$$ (2398a)

$$Y_{9,9}^{(c)}$$ (2399a)

$$Y_{9,6}^{(c)}$$ (2400a)

$$Y_{9,3}^{(c)}$$ (2401a)

16.1.11 $A : l = 10$

$$-Y_{10,6}^{(s)}$$ (2402a)

$$-Y_{10,3}^{(s)}$$ (2403a)

$$Y_{10,3}^{(c)}$$ (2404a)

$$-Y_{10,9}^{(s)}$$ (2405a)

$$Y_{10,0}^{(c)}$$ (2406a)

$$Y_{10,6}^{(c)}$$ (2407a)

$$Y_{10,9}^{(c)}$$ (2408a)

16.1.12 $A : l = 11$

$$-Y_{11,3}^{(s)}$$ (2409a)

$$-Y_{11,6}^{(s)}$$ (2410a)

$$Y_{11,3}^{(c)}$$ (2411a)

$$Y_{11,6}^{(c)}$$ (2412a)

$$Y_{11,9}^{(c)}$$ (2413a)

$$Y_{11,0}^{(c)}$$ (2414a)

$$-Y_{11,9}^{(s)}$$ (2415a)

16.1.13 $A : l = 12$

$$Y_{12,9}^{(c)}$$ (2416a)

$$Y_{12,6}^{(c)}$$ (2417a)

$$-Y_{12,12}^{(s)}$$ (2418a)

$$-Y_{12,3}^{(s)}$$ (2419a)

$$-Y_{12,6}^{(s)}$$ (2420a)

$$Y_{12,0}^{(c)}$$ (2421a)

$$Y_{12,3}^{(c)}$$ (2422a)

$$Y_{12,12}^{(c)}$$ (2423a)

$$-Y_{12,9}^{(s)}$$ (2424a)

16.2 E^1

16.2.1 $E^1 : l = 1$

$$\frac{\sqrt{2}Y_{1,1}^{(c)}}{2} + \frac{\sqrt{2}iY_{1,1}^{(s)}}{2}$$ (2425a)

16.2.2 $E^1 : l = 2$

$$-\frac{\sqrt{2}iY_{2,2}^{(c)}}{2} - \frac{\sqrt{2}Y_{2,2}^{(s)}}{2}$$ (2426a)

$$\frac{\sqrt{2}Y_{2,1}^{(c)}}{2} + \frac{\sqrt{2}iY_{2,1}^{(s)}}{2}$$ (2427a)

16.2.3 $E^1 : l = 3$

$$\frac{\sqrt{2}Y_{3,2}^{(c)}}{2} - \frac{\sqrt{2}iY_{3,2}^{(s)}}{2}$$ (2428a)

$$\frac{\sqrt{2}iY_{3,1}^{(c)}}{2} - \frac{\sqrt{2}Y_{3,1}^{(s)}}{2}$$ (2429a)

16.2.4 $E^1 : l = 4$

$$\frac{\sqrt{2}Y_{4,1}^{(c)}}{2} + \frac{\sqrt{2}iY_{4,1}^{(s)}}{2}$$ (2430a)

$$-\frac{\sqrt{2}iY_{4,2}^{(c)}}{2} - \frac{\sqrt{2}Y_{4,2}^{(s)}}{2}$$ (2431a)

$$\frac{\sqrt{2}Y_{4,4}^{(c)}}{2} + \frac{\sqrt{2}iY_{4,4}^{(s)}}{2}$$ (2432a)

16.2.5 $E^1 : l = 5$

$$\frac{\sqrt{2}Y_{5,1}^{(c)}}{2} + \frac{\sqrt{2}iY_{5,1}^{(s)}}{2}$$ (2433a)

$$-\frac{\sqrt{2}iY_{5,2}^{(c)}}{2} - \frac{\sqrt{2}Y_{5,2}^{(s)}}{2}$$ (2434a)

$$-\frac{\sqrt{2}iY_{5,5}^{(c)}}{2} - \frac{\sqrt{2}Y_{5,5}^{(s)}}{2}$$ (2435a)

$$\frac{\sqrt{2}iY_{5,4}^{(c)}}{2} - \frac{\sqrt{2}Y_{5,4}^{(s)}}{2}$$ (2436a)

16.2.6 $E^1 : l = 6$

$$-\frac{\sqrt{2}iY_{6,2}^{(c)}}{2} - \frac{\sqrt{2}Y_{6,2}^{(s)}}{2}$$ (2437a)

$$\frac{\sqrt{2}Y_{6,4}^{(c)}}{2} + \frac{\sqrt{2}iY_{6,4}^{(s)}}{2}$$ (2438a)

$$\frac{\sqrt{2}Y_{6,1}^{(c)}}{2} + \frac{\sqrt{2}iY_{6,1}^{(s)}}{2}$$ (2439a)

$$-\frac{\sqrt{2}iY_{6,5}^{(c)}}{2} - \frac{\sqrt{2}Y_{6,5}^{(s)}}{2}$$ (2440a)

16.2.7 $E^1 : l = 7$

$$\frac{\sqrt{2}Y_{7,5}^{(c)}}{2} - \frac{\sqrt{2}iY_{7,5}^{(s)}}{2}$$ (2441a)

$$\frac{\sqrt{2}Y_{7,2}^{(c)}}{2} - \frac{\sqrt{2}iY_{7,2}^{(s)}}{2}$$ (2442a)

$$\frac{\sqrt{2}Y_{7,7}^{(c)}}{2} + \frac{\sqrt{2}iY_{7,7}^{(s)}}{2}$$ (2443a)

$$\frac{\sqrt{2}iY_{7,4}^{(c)}}{2} - \frac{\sqrt{2}Y_{7,4}^{(s)}}{2}$$ (2444a)

$$\frac{\sqrt{2}iY_{7,1}^{(c)}}{2} - \frac{\sqrt{2}Y_{7,1}^{(s)}}{2}$$ (2445a)

16.2.8 $E^1 : l = 8$

$$-\frac{\sqrt{2}iY_{8,8}^{(c)}}{2} - \frac{\sqrt{2}Y_{8,8}^{(s)}}{2}$$ (2446a)

$$\frac{\sqrt{2}iY_{8,7}^{(c)}}{2} - \frac{\sqrt{2}Y_{8,7}^{(s)}}{2}$$ (2447a)

$$\frac{\sqrt{2}Y_{8,1}^{(c)}}{2} + \frac{\sqrt{2}iY_{8,1}^{(s)}}{2}$$ (2448a)

$$\frac{\sqrt{2}Y_{8,4}^{(c)}}{2} + \frac{\sqrt{2}iY_{8,4}^{(s)}}{2}$$ (2449a)

$$-\frac{\sqrt{2}iY_{8,2}^{(c)}}{2} - \frac{\sqrt{2}Y_{8,2}^{(s)}}{2}$$ (2450a)

$$-\frac{\sqrt{2}iY_{8,5}^{(c)}}{2} - \frac{\sqrt{2}Y_{8,5}^{(s)}}{2}$$ (2451a)

16.2.9 $E^1 : l = 9$

$$\frac{\sqrt{2}Y_{9,5}^{(c)}}{2} - \frac{\sqrt{2}iY_{9,5}^{(s)}}{2}$$ (2452a)

$$\frac{\sqrt{2}Y_{9,7}^{(c)}}{2} + \frac{\sqrt{2}iY_{9,7}^{(s)}}{2}$$ (2453a)

$$\frac{\sqrt{2}iY_{9,4}^{(c)}}{2} - \frac{\sqrt{2}Y_{9,4}^{(s)}}{2}$$ (2454a)

$$\frac{\sqrt{2}Y_{9,2}^{(c)}}{2} - \frac{\sqrt{2}iY_{9,2}^{(s)}}{2}$$ (2455a)

$$-\frac{\sqrt{2}iY_{9,8}^{(c)}}{2} - \frac{\sqrt{2}Y_{9,8}^{(s)}}{2}$$ (2456a)

$$\frac{\sqrt{2}Y_{9,1}^{(c)}}{2} + \frac{\sqrt{2}iY_{9,1}^{(s)}}{2}$$ (2457a)

16.2.10 $\quad E^1 : l = 10$

$$\frac{\sqrt{2}i Y_{10,7}^{(c)}}{2} - \frac{\sqrt{2} Y_{10,7}^{(s)}}{2} \qquad (2458a)$$

$$\frac{\sqrt{2} Y_{10,2}^{(c)}}{2} - \frac{\sqrt{2}i Y_{10,2}^{(s)}}{2} \qquad (2459a)$$

$$\frac{\sqrt{2} Y_{10,5}^{(c)}}{2} - \frac{\sqrt{2}i Y_{10,5}^{(s)}}{2} \qquad (2460a)$$

$$\frac{\sqrt{2} Y_{10,10}^{(c)}}{2} + \frac{\sqrt{2}i Y_{10,10}^{(s)}}{2} \qquad (2461a)$$

$$\frac{\sqrt{2}i Y_{10,1}^{(c)}}{2} + \frac{\sqrt{2} Y_{10,1}^{(s)}}{2} \qquad (2462a)$$

$$-\frac{\sqrt{2}i Y_{10,8}^{(c)}}{2} - \frac{\sqrt{2} Y_{10,8}^{(s)}}{2} \qquad (2463a)$$

$$\frac{\sqrt{2}i Y_{10,4}^{(c)}}{2} - \frac{\sqrt{2} Y_{10,4}^{(s)}}{2} \qquad (2464a)$$

16.2.11 $\quad E^1 : l = 11$

$$\frac{\sqrt{2} Y_{11,7}^{(c)}}{2} + \frac{\sqrt{2}i Y_{11,7}^{(s)}}{2} \qquad (2465a)$$

$$\frac{\sqrt{2} Y_{11,4}^{(c)}}{2} + \frac{\sqrt{2}i Y_{11,4}^{(s)}}{2} \qquad (2466a)$$

$$-\frac{\sqrt{2}i Y_{11,8}^{(c)}}{2} - \frac{\sqrt{2} Y_{11,8}^{(s)}}{2} \qquad (2467a)$$

$$-\frac{\sqrt{2}i Y_{11,2}^{(c)}}{2} - \frac{\sqrt{2} Y_{11,2}^{(s)}}{2} \qquad (2468a)$$

$$-\frac{\sqrt{2}i Y_{11,11}^{(c)}}{2} - \frac{\sqrt{2} Y_{11,11}^{(s)}}{2} \qquad (2469a)$$

$$\frac{\sqrt{2}i Y_{11,1}^{(c)}}{2} - \frac{\sqrt{2} Y_{11,1}^{(s)}}{2} \qquad (2470a)$$

$$\frac{\sqrt{2}i Y_{11,10}^{(c)}}{2} - \frac{\sqrt{2} Y_{11,10}^{(s)}}{2} \qquad (2471a)$$

$$\frac{\sqrt{2} Y_{11,5}^{(c)}}{2} - \frac{\sqrt{2}i Y_{11,5}^{(s)}}{2} \qquad (2472a)$$

16.2.12 $\quad E^1 : l = 12$

$$\frac{\sqrt{2} Y_{12,5}^{(c)}}{2} - \frac{\sqrt{2}i Y_{12,5}^{(s)}}{2} \qquad (2473a)$$

$$\frac{\sqrt{2} Y_{12,7}^{(c)}}{2} + \frac{\sqrt{2}i Y_{12,7}^{(s)}}{2} \qquad (2474a)$$

$$\frac{\sqrt{2} Y_{12,11}^{(c)}}{2} - \frac{\sqrt{2}i Y_{12,11}^{(s)}}{2} \qquad (2475a)$$

$$\frac{\sqrt{2} Y_{12,1}^{(c)}}{2} + \frac{\sqrt{2}i Y_{12,1}^{(s)}}{2} \qquad (2476a)$$

$$\frac{\sqrt{2} Y_{12,2}^{(c)}}{2} - \frac{\sqrt{2}i Y_{12,2}^{(s)}}{2} \qquad (2477a)$$

$$\frac{\sqrt{2} Y_{12,8}^{(c)}}{2} - \frac{\sqrt{2}i Y_{12,8}^{(s)}}{2} \qquad (2478a)$$

$$\frac{\sqrt{2} Y_{12,10}^{(c)}}{2} + \frac{\sqrt{2}i Y_{12,10}^{(s)}}{2} \qquad (2479a)$$

$$\frac{\sqrt{2}i Y_{12,4}^{(c)}}{2} - \frac{\sqrt{2} Y_{12,4}^{(s)}}{2} \qquad (2480a)$$

16.3 $\quad E^2$

16.3.1 $\quad E^2 : l = 1$

$$-\frac{\sqrt{2}i Y_{1,1}^{(c)}}{2} - \frac{\sqrt{2} Y_{1,1}^{(s)}}{2} \qquad (2481a)$$

16.3.2 $\quad E^2 : l = 2$

$$\frac{\sqrt{2}i Y_{2,2}^{(c)}}{2} - \frac{\sqrt{2} Y_{2,2}^{(s)}}{2} \qquad (2482a)$$

$$\frac{\sqrt{2} Y_{2,1}^{(c)}}{2} - \frac{\sqrt{2}i Y_{2,1}^{(s)}}{2} \qquad (2483a)$$

16.3.3 $\quad E^2 : l = 3$

$$\frac{\sqrt{2} Y_{3,2}^{(c)}}{2} + \frac{\sqrt{2}i Y_{3,2}^{(s)}}{2} \qquad (2484a)$$

$$-\frac{\sqrt{2}i Y_{3,1}^{(c)}}{2} - \frac{\sqrt{2} Y_{3,1}^{(s)}}{2} \qquad (2485a)$$

16.3.4 $\quad E^2 : l = 4$

$$\frac{\sqrt{2} Y_{4,1}^{(c)}}{2} - \frac{\sqrt{2}i Y_{4,1}^{(s)}}{2} \qquad (2486a)$$

$$\frac{\sqrt{2} Y_{4,4}^{(c)}}{2} - \frac{\sqrt{2}i Y_{4,4}^{(s)}}{2} \qquad (2487a)$$

$$\frac{\sqrt{2}i Y_{4,2}^{(c)}}{2} - \frac{\sqrt{2} Y_{4,2}^{(s)}}{2} \qquad (2488a)$$

16.3.5 $\quad E^2 : l = 5$

$$\frac{\sqrt{2}i Y_{5,2}^{(c)}}{2} - \frac{\sqrt{2} Y_{5,2}^{(s)}}{2} \qquad (2489a)$$

$$\frac{\sqrt{2} Y_{5,5}^{(c)}}{2} + \frac{\sqrt{2}i Y_{5,5}^{(s)}}{2} \qquad (2490a)$$

$$\frac{\sqrt{2} Y_{5,1}^{(c)}}{2} - \frac{\sqrt{2}i Y_{5,1}^{(s)}}{2} \qquad (2491a)$$

$$-\frac{\sqrt{2}i Y_{5,4}^{(c)}}{2} - \frac{\sqrt{2} Y_{5,4}^{(s)}}{2} \qquad (2492a)$$

16.3.6 $\quad E^2 : l = 6$

$$-\frac{\sqrt{2}i Y_{6,1}^{(c)}}{2} - \frac{\sqrt{2} Y_{6,1}^{(s)}}{2} \qquad (2493a)$$

$$\frac{\sqrt{2}i Y_{6,2}^{(c)}}{2} - \frac{\sqrt{2} Y_{6,2}^{(s)}}{2} \qquad (2494a)$$

$$\frac{\sqrt{2}i Y_{6,5}^{(c)}}{2} - \frac{\sqrt{2} Y_{6,5}^{(s)}}{2} \qquad (2495a)$$

$$-\frac{\sqrt{2}i Y_{6,4}^{(c)}}{2} - \frac{\sqrt{2} Y_{6,4}^{(s)}}{2} \qquad (2496a)$$

16.3.7 $\quad E^2 : l = 7$

$$-\frac{\sqrt{2}i Y_{7,7}^{(c)}}{2} - \frac{\sqrt{2} Y_{7,7}^{(s)}}{2} \qquad (2497a)$$

$$\frac{\sqrt{2} Y_{7,4}^{(c)}}{2} - \frac{\sqrt{2}i Y_{7,4}^{(s)}}{2} \qquad (2498a)$$

$$-\frac{\sqrt{2}i Y_{7,1}^{(c)}}{2} - \frac{\sqrt{2} Y_{7,1}^{(s)}}{2} \qquad (2499a)$$

$$\frac{\sqrt{2}i Y_{7,5}^{(c)}}{2} - \frac{\sqrt{2} Y_{7,5}^{(s)}}{2} \qquad (2500a)$$

$$\frac{\sqrt{2}i Y_{7,2}^{(c)}}{2} - \frac{\sqrt{2} Y_{7,2}^{(s)}}{2} \qquad (2501a)$$

16.3.8 $\quad E^2 : l = 8$

$$\frac{\sqrt{2}i Y_{8,2}^{(c)}}{2} - \frac{\sqrt{2} Y_{8,2}^{(s)}}{2} \qquad (2502a)$$

$$\frac{\sqrt{2} Y_{8,1}^{(c)}}{2} - \frac{\sqrt{2}i Y_{8,1}^{(s)}}{2} \qquad (2503a)$$

$$\frac{\sqrt{2}i Y_{8,8}^{(c)}}{2} - \frac{\sqrt{2} Y_{8,8}^{(s)}}{2} \qquad (2504a)$$

$$\frac{\sqrt{2} Y_{8,4}^{(c)}}{2} - \frac{\sqrt{2}i Y_{8,4}^{(s)}}{2} \qquad (2505a)$$

$$\frac{\sqrt{2} Y_{8,5}^{(c)}}{2} + \frac{\sqrt{2}i Y_{8,5}^{(s)}}{2} \qquad (2506a)$$

$$\frac{\sqrt{2} Y_{8,7}^{(c)}}{2} - \frac{\sqrt{2}i Y_{8,7}^{(s)}}{2} \qquad (2507a)$$

16.3.9 $\quad E^2 : l = 9$

$$-\frac{\sqrt{2}i Y_{9,1}^{(c)}}{2} - \frac{\sqrt{2} Y_{9,1}^{(s)}}{2} \qquad (2508a)$$

$$\frac{\sqrt{2} Y_{9,4}^{(c)}}{2} + \frac{\sqrt{2}i Y_{9,4}^{(s)}}{2} \qquad (2509a)$$

$$\frac{\sqrt{2}i Y_{9,5}^{(c)}}{2} - \frac{\sqrt{2} Y_{9,5}^{(s)}}{2} \qquad (2510a)$$

$$\frac{\sqrt{2} Y_{9,8}^{(c)}}{2} + \frac{\sqrt{2}i Y_{9,8}^{(s)}}{2} \qquad (2511a)$$

$$-\frac{\sqrt{2}i Y_{9,7}^{(c)}}{2} - \frac{\sqrt{2} Y_{9,7}^{(s)}}{2} \qquad (2512a)$$

$$\frac{\sqrt{2}i Y_{9,2}^{(c)}}{2} - \frac{\sqrt{2} Y_{9,2}^{(s)}}{2} \qquad (2513a)$$

16.3.10 $\quad E^2 : l = 10$

$$-\frac{\sqrt{2}i Y_{10,1}^{(c)}}{2} - \frac{\sqrt{2} Y_{10,1}^{(s)}}{2} \qquad (2514a)$$

$$\frac{\sqrt{2} Y_{10,10}^{(c)}}{2} - \frac{\sqrt{2}i Y_{10,10}^{(s)}}{2} \qquad (2515a)$$

$$\frac{\sqrt{2} Y_{10,2}^{(c)}}{2} - \frac{\sqrt{2}i Y_{10,2}^{(s)}}{2} \qquad (2516a)$$

$$-\frac{\sqrt{2}i Y_{10,4}^{(c)}}{2} - \frac{\sqrt{2} Y_{10,4}^{(s)}}{2} \qquad (2517a)$$

$$\frac{\sqrt{2}i Y_{10,5}^{(c)}}{2} - \frac{\sqrt{2} Y_{10,5}^{(s)}}{2} \qquad (2518a)$$

$$\frac{\sqrt{2}i Y_{10,8}^{(c)}}{2} - \frac{\sqrt{2} Y_{10,8}^{(s)}}{2} \qquad (2519a)$$

$$\frac{\sqrt{2} Y_{10,7}^{(c)}}{2} - \frac{\sqrt{2}i Y_{10,7}^{(s)}}{2} \qquad (2520a)$$

16.3.11 $\quad E^2 : l = 11$

$$\frac{\sqrt{2} Y_{11,8}^{(c)}}{2} + \frac{\sqrt{2}i Y_{11,8}^{(s)}}{2} \qquad (2521a)$$

$$-\frac{\sqrt{2}i Y_{11,7}^{(c)}}{2} - \frac{\sqrt{2} Y_{11,7}^{(s)}}{2} \qquad (2522a)$$

$$-\frac{\sqrt{2}i Y_{11,1}^{(c)}}{2} - \frac{\sqrt{2} Y_{11,1}^{(s)}}{2} \qquad (2523a)$$

$$\frac{\sqrt{2} Y_{11,10}^{(c)}}{2} - \frac{\sqrt{2}i Y_{11,10}^{(s)}}{2} \qquad (2524a)$$

$$\frac{\sqrt{2}i Y_{11,2}^{(c)}}{2} - \frac{\sqrt{2} Y_{11,2}^{(s)}}{2} \qquad (2525a)$$

$$-\frac{\sqrt{2}i Y_{11,4}^{(c)}}{2} - \frac{\sqrt{2} Y_{11,4}^{(s)}}{2} \qquad (2526a)$$

$$\frac{\sqrt{2}i Y_{11,5}^{(c)}}{2} - \frac{\sqrt{2} Y_{11,5}^{(s)}}{2} \qquad (2527a)$$

$$\frac{\sqrt{2}i Y_{11,11}^{(c)}}{2} - \frac{\sqrt{2} Y_{11,11}^{(s)}}{2} \qquad (2528a)$$

16.3.12 $\quad E^2 : l = 12$

$$\frac{\sqrt{2} Y_{12,4}^{(c)}}{2} - \frac{\sqrt{2}i Y_{12,4}^{(s)}}{2} \qquad (2529a)$$

$$-\frac{\sqrt{2}i Y_{12,7}^{(c)}}{2} - \frac{\sqrt{2} Y_{12,7}^{(s)}}{2} \qquad (2530a)$$

$$\frac{\sqrt{2} Y_{12,5}^{(c)}}{2} + \frac{\sqrt{2}i Y_{12,5}^{(s)}}{2} \qquad (2531a)$$

$$-\frac{\sqrt{2}i Y_{12,1}^{(c)}}{2} - \frac{\sqrt{2} Y_{12,1}^{(s)}}{2} \qquad (2532a)$$

$$-\frac{\sqrt{2}i Y_{12,10}^{(c)}}{2} - \frac{\sqrt{2} Y_{12,10}^{(s)}}{2} \qquad (2533a)$$

$$\frac{\sqrt{2}i Y_{12,2}^{(c)}}{2} - \frac{\sqrt{2} Y_{12,2}^{(s)}}{2} \qquad (2534a)$$

$$\frac{\sqrt{2}i Y_{12,8}^{(c)}}{2} - \frac{\sqrt{2} Y_{12,8}^{(s)}}{2} \qquad (2535a)$$

$$\frac{\sqrt{2}i Y_{12,11}^{(c)}}{2} - \frac{\sqrt{2} Y_{12,11}^{(s)}}{2} \qquad (2536a)$$

17 Group S_6

17.1 A_g

17.1.1 $A_g : l = 0$

$$Y_{0,0}^{(c)} \tag{2537a}$$

17.1.2 $A_g : l = 2$

$$Y_{2,0}^{(c)} \tag{2538a}$$

17.1.3 $A_g : l = 4$

$$Y_{4,0}^{(c)} \tag{2539a}$$

$$Y_{4,3}^{(c)} \tag{2540a}$$

$$-Y_{4,3}^{(s)} \tag{2541a}$$

17.1.4 $A_g : l = 6$

$$-Y_{6,6}^{(s)} \tag{2542a}$$

$$Y_{6,6}^{(c)} \tag{2543a}$$

$$-Y_{6,3}^{(s)} \tag{2544a}$$

$$Y_{6,3}^{(c)} \tag{2545a}$$

$$Y_{6,0}^{(c)} \tag{2546a}$$

17.1.5 $A_g : l = 8$

$$Y_{8,6}^{(c)} \tag{2547a}$$

$$-Y_{8,6}^{(s)} \tag{2548a}$$

$$-Y_{8,3}^{(s)} \tag{2549a}$$

$$Y_{8,3}^{(c)} \tag{2550a}$$

$$Y_{8,0}^{(c)} \tag{2551a}$$

17.1.6 $A_g : l = 10$

$$-Y_{10,6}^{(s)} \tag{2552a}$$

$$-Y_{10,3}^{(s)} \tag{2553a}$$

$$Y_{10,3}^{(c)} \tag{2554a}$$

$$-Y_{10,9}^{(s)} \tag{2555a}$$

$$Y_{10,0}^{(c)} \tag{2556a}$$

$$Y_{10,6}^{(c)} \tag{2557a}$$

$$Y_{10,9}^{(c)} \tag{2558a}$$

17.1.7 $A_g : l = 12$

$$Y_{12,9}^{(c)} \tag{2559a}$$

$$Y_{12,6}^{(c)} \tag{2560a}$$

$$-Y_{12,12}^{(s)} \tag{2561a}$$

$$-Y_{12,3}^{(s)} \tag{2562a}$$

$$-Y_{12,6}^{(s)} \tag{2563a}$$

$$Y_{12,0}^{(c)} \tag{2564a}$$

$$Y_{12,3}^{(c)} \tag{2565a}$$

$$Y_{12,12}^{(c)} \tag{2566a}$$

$$-Y_{12,9}^{(s)} \tag{2567a}$$

17.2 A_u

17.2.1 $A_u : l = 1$

$$Y_{1,0}^{(c)} \tag{2568a}$$

17.2.2 $A_u : l = 3$

$$Y_{3,3}^{(c)} \tag{2569a}$$

$$-Y_{3,3}^{(s)} \tag{2570a}$$

$$Y_{3,0}^{(c)} \tag{2571a}$$

17.2.3 $A_u : l = 5$

$$-Y_{5,3}^{(s)} \tag{2572a}$$

$$Y_{5,3}^{(c)} \tag{2573a}$$

$$Y_{5,0}^{(c)} \tag{2574a}$$

17.2.4 $A_u : l = 7$

$$Y_{7,6}^{(c)} \tag{2575a}$$

$$-Y_{7,3}^{(s)} \tag{2576a}$$

$$Y_{7,3}^{(c)} \tag{2577a}$$

$$-Y_{7,6}^{(s)} \tag{2578a}$$

$$Y_{7,0}^{(c)} \tag{2579a}$$

17.2.5 $A_u : l = 9$

$$-Y_{9,9}^{(s)} \tag{2580a}$$

$$-Y_{9,6}^{(s)} \tag{2581a}$$

$$Y_{9,0}^{(c)} \tag{2582a}$$

$$-Y_{9,3}^{(s)} \tag{2583a}$$

$$Y_{9,9}^{(c)} \tag{2584a}$$

$$Y_{9,6}^{(c)} \tag{2585a}$$

$$Y_{9,3}^{(c)} \tag{2586a}$$

17.2.6 $A_u : l = 11$

$$-Y_{11,3}^{(s)} \tag{2587a}$$

$$-Y_{11,6}^{(s)} \tag{2588a}$$

$$Y_{11,3}^{(c)} \tag{2589a}$$

$$Y_{11,6}^{(c)} \tag{2590a}$$

$$Y_{11,9}^{(c)} \tag{2591a}$$

$$Y_{11,0}^{(c)} \tag{2592a}$$

$$-Y_{11,9}^{(s)} \tag{2593a}$$

17.3 E_u^1

17.3.1 $E_u^1 : l = 1$

$$\frac{\sqrt{2}Y_{1,1}^{(c)}}{2} + \frac{\sqrt{2}iY_{1,1}^{(s)}}{2} \tag{2594a}$$

17.3.2 $E_u^1 : l = 3$

$$\frac{\sqrt{2}iY_{3,1}^{(c)}}{2} - \frac{\sqrt{2}Y_{3,1}^{(s)}}{2} \tag{2595a}$$

$$\frac{\sqrt{2}Y_{3,2}^{(c)}}{2} - \frac{\sqrt{2}iY_{3,2}^{(s)}}{2} \tag{2596a}$$

17.3.3 $E_u^1 : l = 5$

$$\frac{\sqrt{2}Y_{5,2}^{(c)}}{2} - \frac{\sqrt{2}iY_{5,2}^{(s)}}{2} \tag{2597a}$$

$$\frac{\sqrt{2}iY_{5,4}^{(c)}}{2} - \frac{\sqrt{2}Y_{5,4}^{(s)}}{2} \tag{2598a}$$

$$-\frac{\sqrt{2}iY_{5,5}^{(c)}}{2} - \frac{\sqrt{2}Y_{5,5}^{(s)}}{2} \tag{2599a}$$

$$\frac{\sqrt{2}iY_{5,1}^{(c)}}{2} - \frac{\sqrt{2}Y_{5,1}^{(s)}}{2} \tag{2600a}$$

17.3.4 $E_u^1 : l = 7$

$$\frac{\sqrt{2}Y_{7,5}^{(c)}}{2} - \frac{\sqrt{2}iY_{7,5}^{(s)}}{2} \tag{2601a}$$

$$\frac{\sqrt{2}iY_{7,7}^{(c)}}{2} - \frac{\sqrt{2}Y_{7,7}^{(s)}}{2} \tag{2602a}$$

$$\frac{\sqrt{2}Y_{7,2}^{(c)}}{2} - \frac{\sqrt{2}iY_{7,2}^{(s)}}{2} \tag{2603a}$$

$$\frac{\sqrt{2}iY_{7,1}^{(c)}}{2} - \frac{\sqrt{2}Y_{7,1}^{(s)}}{2} \tag{2604a}$$

$$\frac{\sqrt{2}iY_{7,4}^{(c)}}{2} - \frac{\sqrt{2}Y_{7,4}^{(s)}}{2} \tag{2605a}$$

17.3.5 $E_u^1 : l = 9$

$$\frac{\sqrt{2}Y_{9,5}^{(c)}}{2} - \frac{\sqrt{2}iY_{9,5}^{(s)}}{2} \tag{2606a}$$

$$\frac{\sqrt{2}iY_{9,1}^{(c)}}{2} - \frac{\sqrt{2}Y_{9,1}^{(s)}}{2} \tag{2607a}$$

$$-\frac{\sqrt{2}iY_{9,8}^{(c)}}{2} - \frac{\sqrt{2}Y_{9,8}^{(s)}}{2} \tag{2608a}$$

$$-\frac{\sqrt{2}iY_{9,2}^{(c)}}{2} - \frac{\sqrt{2}Y_{9,2}^{(s)}}{2} \tag{2609a}$$

$$\frac{\sqrt{2}Y_{9,4}^{(c)}}{2} + \frac{\sqrt{2}iY_{9,4}^{(s)}}{2} \tag{2610a}$$

$$\frac{\sqrt{2}iY_{9,7}^{(c)}}{2} - \frac{\sqrt{2}Y_{9,7}^{(s)}}{2} \tag{2611a}$$

17.3.6 $E_u^1 : l = 11$

$$\frac{\sqrt{2}Y_{11,11}^{(c)}}{2} - \frac{\sqrt{2}iY_{11,11}^{(s)}}{2} \tag{2612a}$$

$$\frac{\sqrt{2}iY_{11,4}^{(c)}}{2} - \frac{\sqrt{2}Y_{11,4}^{(s)}}{2} \tag{2613a}$$

$$\frac{\sqrt{2}Y_{11,10}^{(c)}}{2} + \frac{\sqrt{2}iY_{11,10}^{(s)}}{2} \tag{2614a}$$

$$-\frac{\sqrt{2}iY_{11,5}^{(c)}}{2} - \frac{\sqrt{2}Y_{11,5}^{(s)}}{2} \tag{2615a}$$

$$\frac{\sqrt{2}Y_{11,7}^{(c)}}{2} + \frac{\sqrt{2}iY_{11,7}^{(s)}}{2} \tag{2616a}$$

$$\frac{\sqrt{2}Y_{11,2}^{(c)}}{2} - \frac{\sqrt{2}iY_{11,2}^{(s)}}{2} \tag{2617a}$$

$$\frac{\sqrt{2}Y_{11,1}^{(c)}}{2} + \frac{\sqrt{2}iY_{11,1}^{(s)}}{2} \tag{2618a}$$

$$-\frac{\sqrt{2}iY_{11,8}^{(c)}}{2} - \frac{\sqrt{2}Y_{11,8}^{(s)}}{2} \tag{2619a}$$

17.4 E_u^2

17.4.1 $E_u^2 : l = 1$

$$-\frac{\sqrt{2}iY_{1,1}^{(c)}}{2} - \frac{\sqrt{2}Y_{1,1}^{(s)}}{2} \tag{2620a}$$

17.4.2 $E_u^2 : l = 3$

$$\frac{\sqrt{2}iY_{3,2}^{(c)}}{2} - \frac{\sqrt{2}Y_{3,2}^{(s)}}{2} \tag{2621a}$$

$$-\frac{\sqrt{2}iY_{3,1}^{(c)}}{2} - \frac{\sqrt{2}Y_{3,1}^{(s)}}{2} \tag{2622a}$$

17.4.3 $E_u^2 : l = 5$

$$\frac{\sqrt{2}Y_{5,4}^{(c)}}{2} - \frac{\sqrt{2}iY_{5,4}^{(s)}}{2}$$
(2623a)

$$\frac{\sqrt{2}Y_{5,2}^{(c)}}{2} + \frac{\sqrt{2}iY_{5,2}^{(s)}}{2}$$
(2624a)

$$\frac{\sqrt{2}iY_{5,5}^{(c)}}{2} - \frac{\sqrt{2}Y_{5,5}^{(s)}}{2}$$
(2625a)

$$\frac{\sqrt{2}Y_{5,1}^{(c)}}{2} - \frac{\sqrt{2}iY_{5,1}^{(s)}}{2}$$
(2626a)

17.4.4 $E_u^2 : l = 7$

$$\frac{\sqrt{2}Y_{7,2}^{(c)}}{2} + \frac{\sqrt{2}iY_{7,2}^{(s)}}{2}$$
(2627a)

$$\frac{\sqrt{2}Y_{7,7}^{(c)}}{2} - \frac{\sqrt{2}iY_{7,7}^{(s)}}{2}$$
(2628a)

$$-\frac{\sqrt{2}iY_{7,4}^{(c)}}{2} - \frac{\sqrt{2}Y_{7,4}^{(s)}}{2}$$
(2629a)

$$\frac{\sqrt{2}Y_{7,5}^{(c)}}{2} + \frac{\sqrt{2}iY_{7,5}^{(s)}}{2}$$
(2630a)

$$\frac{\sqrt{2}Y_{7,1}^{(c)}}{2} - \frac{\sqrt{2}iY_{7,1}^{(s)}}{2}$$
(2631a)

17.4.5 $E_u^2 : l = 9$

$$\frac{\sqrt{2}Y_{9,5}^{(c)}}{2} + \frac{\sqrt{2}iY_{9,5}^{(s)}}{2}$$
(2632a)

$$\frac{\sqrt{2}Y_{9,7}^{(c)}}{2} - \frac{\sqrt{2}iY_{9,7}^{(s)}}{2}$$
(2633a)

$$\frac{\sqrt{2}iY_{9,8}^{(c)}}{2} - \frac{\sqrt{2}Y_{9,8}^{(s)}}{2}$$
(2634a)

$$\frac{\sqrt{2}Y_{9,4}^{(c)}}{2} - \frac{\sqrt{2}iY_{9,4}^{(s)}}{2}$$
(2635a)

$$-\frac{\sqrt{2}iY_{9,1}^{(c)}}{2} - \frac{\sqrt{2}Y_{9,1}^{(s)}}{2}$$
(2636a)

$$\frac{\sqrt{2}Y_{9,2}^{(c)}}{2} + \frac{\sqrt{2}iY_{9,2}^{(s)}}{2}$$
(2637a)

17.4.6 $E_u^2 : l = 11$

$$\frac{\sqrt{2}Y_{11,7}^{(c)}}{2} - \frac{\sqrt{2}iY_{11,7}^{(s)}}{2}$$
(2638a)

$$\frac{\sqrt{2}Y_{11,10}^{(c)}}{2} - \frac{\sqrt{2}iY_{11,10}^{(s)}}{2}$$
(2639a)

$$\frac{\sqrt{2}Y_{11,11}^{(c)}}{2} + \frac{\sqrt{2}iY_{11,11}^{(s)}}{2}$$
(2640a)

$$\frac{\sqrt{2}iY_{11,2}^{(c)}}{2} - \frac{\sqrt{2}Y_{11,2}^{(s)}}{2}$$
(2641a)

$$\frac{\sqrt{2}iY_{11,8}^{(c)}}{2} - \frac{\sqrt{2}Y_{11,8}^{(s)}}{2}$$
(2642a)

$$\frac{\sqrt{2}Y_{11,5}^{(c)}}{2} + \frac{\sqrt{2}iY_{11,5}^{(s)}}{2}$$
(2643a)

$$-\frac{\sqrt{2}iY_{11,1}^{(c)}}{2} - \frac{\sqrt{2}Y_{11,1}^{(s)}}{2}$$
(2644a)

$$\frac{\sqrt{2}Y_{11,4}^{(c)}}{2} - \frac{\sqrt{2}iY_{11,4}^{(s)}}{2}$$
(2645a)

17.5 E_g^2

17.5.1 $E_g^2 : l = 2$

$$-\frac{\sqrt{2}iY_{2,2}^{(c)}}{2} - \frac{\sqrt{2}Y_{2,2}^{(s)}}{2}$$
(2646a)

$$\frac{\sqrt{2}Y_{2,1}^{(c)}}{2} + \frac{\sqrt{2}iY_{2,1}^{(s)}}{2}$$
(2647a)

17.5.2 $E_g^2 : l = 4$

$$\frac{\sqrt{2}iY_{4,4}^{(c)}}{2} - \frac{\sqrt{2}Y_{4,4}^{(s)}}{2}$$
(2648a)

$$\frac{\sqrt{2}Y_{4,2}^{(c)}}{2} - \frac{\sqrt{2}iY_{4,2}^{(s)}}{2}$$
(2649a)

$$\frac{\sqrt{2}iY_{4,1}^{(c)}}{2} - \frac{\sqrt{2}Y_{4,1}^{(s)}}{2}$$
(2650a)

17.5.3 $E_g^2 : l = 6$

$$-\frac{\sqrt{2}iY_{6,5}^{(c)}}{2} - \frac{\sqrt{2}Y_{6,5}^{(s)}}{2}$$
(2651a)

$$-\frac{\sqrt{2}iY_{6,2}^{(c)}}{2} - \frac{\sqrt{2}Y_{6,2}^{(s)}}{2}$$
(2652a)

$$\frac{\sqrt{2}iY_{6,1}^{(c)}}{2} - \frac{\sqrt{2}Y_{6,1}^{(s)}}{2}$$
(2653a)

$$\frac{\sqrt{2}Y_{6,4}^{(c)}}{2} - \frac{\sqrt{2}Y_{6,4}^{(s)}}{2}$$
(2654a)

17.5.4 $E_g^2 : l = 8$

$$\frac{\sqrt{2}Y_{8,4}^{(c)}}{2} + \frac{\sqrt{2}iY_{8,4}^{(s)}}{2}$$
(2655a)

$$\frac{\sqrt{2}Y_{8,8}^{(c)}}{2} - \frac{\sqrt{2}iY_{8,8}^{(s)}}{2}$$
(2656a)

$$\frac{\sqrt{2}iY_{8,1}^{(c)}}{2} - \frac{\sqrt{2}Y_{8,1}^{(s)}}{2}$$
(2657a)

$$\frac{\sqrt{2}Y_{8,5}^{(c)}}{2} - \frac{\sqrt{2}iY_{8,5}^{(s)}}{2}$$
(2658a)

$$\frac{\sqrt{2}iY_{8,7}^{(c)}}{2} - \frac{\sqrt{2}Y_{8,7}^{(s)}}{2}$$
(2659a)

$$-\frac{\sqrt{2}iY_{8,2}^{(c)}}{2} - \frac{\sqrt{2}Y_{8,2}^{(s)}}{2}$$
(2660a)

17.5.5 $E_g^2 : l = 10$

$$\frac{\sqrt{2}Y_{10,2}^{(c)}}{2} - \frac{\sqrt{2}iY_{10,2}^{(s)}}{2}$$
(2661a)

$$\frac{\sqrt{2}Y_{10,8}^{(c)}}{2} - \frac{\sqrt{2}iY_{10,8}^{(s)}}{2}$$
(2662a)

$$\frac{\sqrt{2}Y_{10,10}^{(c)}}{2} + \frac{\sqrt{2}iY_{10,10}^{(s)}}{2}$$
(2663a)

$$\frac{\sqrt{2}Y_{10,5}^{(c)}}{2} - \frac{\sqrt{2}iY_{10,5}^{(s)}}{2}$$
(2664a)

$$\frac{\sqrt{2}iY_{10,4}^{(c)}}{2} - \frac{\sqrt{2}Y_{10,4}^{(s)}}{2}$$
(2665a)

$$\frac{\sqrt{2}Y_{10,7}^{(c)}}{2} + \frac{\sqrt{2}iY_{10,7}^{(s)}}{2}$$
(2666a)

$$\frac{\sqrt{2}iY_{10,1}^{(c)}}{2} - \frac{\sqrt{2}Y_{10,1}^{(s)}}{2}$$
(2667a)

17.5.6 $E_g^2 : l = 12$

$$\frac{\sqrt{2}iY_{12,7}^{(c)}}{2} - \frac{\sqrt{2}Y_{12,7}^{(s)}}{2}$$
(2668a)

$$\frac{\sqrt{2}Y_{12,11}^{(c)}}{2} - \frac{\sqrt{2}iY_{12,11}^{(s)}}{2}$$
(2669a)

$$\frac{\sqrt{2}Y_{12,8}^{(c)}}{2} - \frac{\sqrt{2}iY_{12,8}^{(s)}}{2}$$
(2670a)

$$\frac{\sqrt{2}iY_{12,1}^{(c)}}{2} - \frac{\sqrt{2}Y_{12,1}^{(s)}}{2}$$
(2671a)

$$\frac{\sqrt{2}iY_{12,4}^{(c)}}{2} - \frac{\sqrt{2}Y_{12,4}^{(s)}}{2}$$
(2672a)

$$-\frac{\sqrt{2}iY_{12,5}^{(c)}}{2} - \frac{\sqrt{2}Y_{12,5}^{(s)}}{2}$$
(2673a)

$$\frac{\sqrt{2}Y_{12,10}^{(c)}}{2} + \frac{\sqrt{2}iY_{12,10}^{(s)}}{2}$$
(2674a)

$$-\frac{\sqrt{2}iY_{12,2}^{(c)}}{2} - \frac{\sqrt{2}Y_{12,2}^{(s)}}{2}$$
(2675a)

17.6 E_g^1

17.6.1 $E_g^1 : l = 2$

$$\frac{\sqrt{2}Y_{2,1}^{(c)}}{2} - \frac{\sqrt{2}iY_{2,1}^{(s)}}{2}$$
(2676a)

$$\frac{\sqrt{2}Y_{2,2}^{(c)}}{2} + \frac{\sqrt{2}iY_{2,2}^{(s)}}{2}$$
(2677a)

17.6.2 $E_g^1 : l = 4$

$$\frac{\sqrt{2}Y_{4,4}^{(c)}}{2} - \frac{\sqrt{2}iY_{4,4}^{(s)}}{2}$$
(2678a)

$$\frac{\sqrt{2}Y_{4,2}^{(c)}}{2} + \frac{\sqrt{2}iY_{4,2}^{(s)}}{2}$$
(2679a)

$$\frac{\sqrt{2}Y_{4,1}^{(c)}}{2} - \frac{\sqrt{2}iY_{4,1}^{(s)}}{2}$$
(2680a)

17.6.3 $E_g^1 : l = 6$

$$\frac{\sqrt{2}Y_{6,4}^{(c)}}{2} - \frac{\sqrt{2}iY_{6,4}^{(s)}}{2}$$
(2681a)

$$\frac{\sqrt{2}Y_{6,1}^{(c)}}{2} - \frac{\sqrt{2}iY_{6,1}^{(s)}}{2}$$
(2682a)

$$\frac{\sqrt{2}Y_{6,5}^{(c)}}{2} + \frac{\sqrt{2}iY_{6,5}^{(s)}}{2}$$
(2683a)

$$\frac{\sqrt{2}iY_{6,2}^{(c)}}{2} - \frac{\sqrt{2}Y_{6,2}^{(s)}}{2}$$
(2684a)

17.6.4 $E_g^1 : l = 8$

$$\frac{\sqrt{2}Y_{8,1}^{(c)}}{2} - \frac{\sqrt{2}iY_{8,1}^{(s)}}{2}$$
(2685a)

$$\frac{\sqrt{2}Y_{8,8}^{(c)}}{2} + \frac{\sqrt{2}iY_{8,8}^{(s)}}{2}$$
(2686a)

$$\frac{\sqrt{2}Y_{8,4}^{(c)}}{2} - \frac{\sqrt{2}iY_{8,4}^{(s)}}{2}$$
(2687a)

$$\frac{\sqrt{2}Y_{8,5}^{(c)}}{2} - \frac{\sqrt{2}iY_{8,5}^{(s)}}{2}$$
(2688a)

$$\frac{\sqrt{2}Y_{8,7}^{(c)}}{2} - \frac{\sqrt{2}iY_{8,7}^{(s)}}{2}$$
(2689a)

$$\frac{\sqrt{2}Y_{8,2}^{(c)}}{2} + \frac{\sqrt{2}iY_{8,2}^{(s)}}{2}$$
(2690a)

17.6.5 $E_g^1 : l = 10$

$$\frac{\sqrt{2}Y_{10,7}^{(c)}}{2} - \frac{\sqrt{2}iY_{10,7}^{(s)}}{2}$$
(2691a)

$$\frac{\sqrt{2}Y_{10,2}^{(c)}}{2} + \frac{\sqrt{2}iY_{10,2}^{(s)}}{2}$$
(2692a)

$$\frac{\sqrt{2}Y_{10,4}^{(c)}}{2} - \frac{\sqrt{2}iY_{10,4}^{(s)}}{2}$$
(2693a)

$$\frac{\sqrt{2}Y_{10,1}^{(c)}}{2} - \frac{\sqrt{2}iY_{10,1}^{(s)}}{2}$$
(2694a)

$$\frac{\sqrt{2}Y_{10,10}^{(c)}}{2} - \frac{\sqrt{2}iY_{10,10}^{(s)}}{2}$$
(2695a)

$$\frac{\sqrt{2}iY_{10,5}^{(c)}}{2} - \frac{\sqrt{2}Y_{10,5}^{(s)}}{2}$$
(2696a)

$$\frac{\sqrt{2}iY_{10,8}^{(c)}}{2} - \frac{\sqrt{2}Y_{10,8}^{(s)}}{2}$$
(2697a)

17.6.6 $E_g^1 : l = 12$

$$-\frac{\sqrt{2}iY_{12,7}^{(c)}}{2} - \frac{\sqrt{2}Y_{12,7}^{(s)}}{2}$$
(2698a)

$$\frac{\sqrt{2}Y_{12,5}^{(c)}}{2} + \frac{\sqrt{2}iY_{12,5}^{(s)}}{2}$$
(2699a)

$$\frac{\sqrt{2}Y_{12,4}^{(c)}}{2} - \frac{\sqrt{2}iY_{12,4}^{(s)}}{2}$$
(2700a)

$$-\frac{\sqrt{2}iY_{12,10}^{(c)}}{2} - \frac{\sqrt{2}Y_{12,10}^{(s)}}{2}$$
(2701a)

$$\frac{\sqrt{2}Y_{12,8}^{(c)}}{2} - \frac{\sqrt{2}iY_{12,8}^{(s)}}{2}$$
(2702a)

$$\frac{\sqrt{2}Y_{12,11}^{(c)}}{2} + \frac{\sqrt{2}iY_{12,11}^{(s)}}{2}$$
(2703a)

$$\frac{\sqrt{2}Y_{12,2}^{(c)}}{2} + \frac{\sqrt{2}iY_{12,2}^{(s)}}{2}$$
(2704a)

$$\frac{\sqrt{2}Y_{12,1}^{(c)}}{2} - \frac{\sqrt{2}iY_{12,1}^{(s)}}{2}$$
(2705a)

18   Group D_3

18.1 A_1

18.1.1 $A_1 : l = 0$

$Y_{0,0}^{(c)}$ (2706a)

18.1.2 $A_1 : l = 2$

$Y_{2,0}^{(c)}$ (2707a)

18.1.3 $A_1 : l = 3$

$Y_{3,3}^{(c)}$ (2708a)

18.1.4 $A_1 : l = 4$

$Y_{4,0}^{(c)}$ (2709a)

$-Y_{4,3}^{(s)}$ (2710a)

18.1.5 $A_1 : l = 5$

$Y_{5,3}^{(c)}$ (2711a)

18.1.6 $A_1 : l = 6$

$-Y_{6,3}^{(s)}$ (2712a)

$Y_{6,6}^{(c)}$ (2713a)

$Y_{6,0}^{(c)}$ (2714a)

18.1.7 $A_1 : l = 7$

$Y_{7,3}^{(c)}$ (2715a)

$-Y_{7,6}^{(s)}$ (2716a)

18.1.8 $A_1 : l = 8$

$Y_{8,6}^{(c)}$ (2717a)

$Y_{8,0}^{(c)}$ (2718a)

$-Y_{8,3}^{(s)}$ (2719a)

18.1.9 $A_1 : l = 9$

$Y_{9,9}^{(c)}$ (2720a)

$Y_{9,3}^{(c)}$ (2721a)

$-Y_{9,6}^{(s)}$ (2722a)

18.1.10 $A_1 : l = 10$

$-Y_{10,3}^{(s)}$ (2723a)

$Y_{10,6}^{(c)}$ (2724a)

$-Y_{10,9}^{(s)}$ (2725a)

$Y_{10,0}^{(c)}$ (2726a)

18.1.11 $A_1 : l = 11$

$Y_{11,3}^{(c)}$ (2727a)

$-Y_{11,6}^{(s)}$ (2728a)

$Y_{11,9}^{(c)}$ (2729a)

18.1.12 $A_1 : l = 12$

$Y_{12,6}^{(c)}$ (2730a)

$-Y_{12,3}^{(s)}$ (2731a)

$Y_{12,0}^{(c)}$ (2732a)

$Y_{12,12}^{(c)}$ (2733a)

$-Y_{12,9}^{(s)}$ (2734a)

18.2 A_2

18.2.1 $A_2 : l = 1$

$Y_{1,0}^{(c)}$ (2735a)

18.2.2 $A_2 : l = 3$

$-Y_{3,3}^{(s)}$ (2736a)

$Y_{3,0}^{(c)}$ (2737a)

18.2.3 $A_2 : l = 4$

$Y_{4,3}^{(c)}$ (2738a)

18.2.4 $A_2 : l = 5$

$-Y_{5,3}^{(s)}$ (2739a)

$Y_{5,0}^{(c)}$ (2740a)

18.2.5 $A_2 : l = 6$

$-Y_{6,6}^{(s)}$ (2741a)

$Y_{6,3}^{(c)}$ (2742a)

18.2.6 $A_2 : l = 7$

$Y_{7,6}^{(c)}$ (2743a)

$-Y_{7,3}^{(s)}$ (2744a)

$Y_{7,0}^{(c)}$ (2745a)

18.2.7 $A_2 : l = 8$

$-Y_{8,6}^{(s)}$ (2746a)

$Y_{8,3}^{(c)}$ (2747a)

18.2.8 $A_2 : l = 9$

$-Y_{9,3}^{(s)}$ (2748a)

$Y_{9,0}^{(c)}$ (2749a)

$Y_{9,6}^{(c)}$ (2750a)

$-Y_{9,9}^{(s)}$ (2751a)

18.2.9 $A_2 : l = 10$

$Y_{10,9}^{(c)}$ (2752a)

$Y_{10,3}^{(c)}$ (2753a)

$-Y_{10,6}^{(s)}$ (2754a)

18.2.10 $A_2 : l = 11$

$Y_{11,6}^{(c)}$ (2755a)

$-Y_{11,9}^{(s)}$ (2756a)

$-Y_{11,3}^{(s)}$ (2757a)

$Y_{11,0}^{(c)}$ (2758a)

18.2.11 $A_2 : l = 12$

$-Y_{12,12}^{(s)}$ (2759a)

$Y_{12,9}^{(c)}$ (2760a)

$Y_{12,3}^{(c)}$ (2761a)

$-Y_{12,6}^{(s)}$ (2762a)

18.3 E

18.3.1 $E : l = 1$

$-Y_{1,1}^{(s)}$ (2763a)

$Y_{1,1}^{(c)}$ (2763b)

18.3.2 $E : l = 2$

$Y_{2,1}^{(c)}$ (2764a)

$Y_{2,1}^{(s)}$ (2764b)

$Y_{2,2}^{(s)}$ (2765a)

$Y_{2,2}^{(c)}$ (2765b)

18.3.3 $E : l = 3$

$Y_{3,2}^{(c)}$ (2766a)

$-Y_{3,2}^{(s)}$ (2766b)

$-Y_{3,1}^{(s)}$ (2767a)

$Y_{3,1}^{(c)}$ (2767b)

18.3.4 $E : l = 4$

$Y_{4,1}^{(c)}$ (2768a)

$Y_{4,1}^{(s)}$ (2768b)

$-Y_{4,2}^{(s)}$ (2769a)

$-Y_{4,2}^{(c)}$ (2769b)

$-Y_{4,4}^{(s)}$ (2770a)

$Y_{4,4}^{(c)}$ (2770b)

18.3.5 $E : l = 5$

$Y_{5,5}^{(s)}$ (2771a)

$Y_{5,5}^{(c)}$ (2771b)

$Y_{5,4}^{(c)}$ (2772a)

$Y_{5,4}^{(s)}$ (2772b)

$-Y_{5,1}^{(s)}$ (2773a)

$Y_{5,1}^{(c)}$ (2773b)

$Y_{5,2}^{(c)}$ (2774a)

$-Y_{5,2}^{(s)}$ (2774b)

18.3.6 $E : l = 6$

$Y_{6,1}^{(c)}$ (2775a)

$Y_{6,1}^{(s)}$ (2775b)

$Y_{6,5}^{(c)}$ (2776a)

$-Y_{6,5}^{(s)}$ (2776b)

$-Y_{6,4}^{(s)}$ (2777a)

$Y_{6,4}^{(c)}$ (2777b)

$Y_{6,2}^{(s)}$ (2778a)

$Y_{6,2}^{(c)}$ (2778b)

18.3.7 $E : l = 7$

$-Y_{7,4}^{(c)}$ (2779a)

$-Y_{7,4}^{(s)}$ (2779b)

$Y_{7,2}^{(c)}$ (2780a)

$-Y_{7,2}^{(s)}$ (2780b)

$-Y_{7,1}^{(s)}$ (2781a)

$Y_{7,1}^{(c)}$ (2781b)

$-Y_{7,7}^{(s)}$ (2782a)

$Y_{7,7}^{(c)}$ (2782b)

$-Y_{7,5}^{(s)}$ (2783a)

$-Y_{7,5}^{(c)}$ (2783b)

18.3.8 $E : l = 8$

$Y_{8,5}^{(c)}$ (2784a)

$-Y_{8,5}^{(s)}$ (2784b)

$-Y_{8,4}^{(s)}$ (2785a)

$Y_{8,4}^{(c)}$ (2785b)

$-Y_{8,8}^{(s)}$ (2786a)

$-Y_{8,8}^{(c)}$ (2786b)

$Y_{8,7}^{(c)}$ (2787a)

$Y_{8,7}^{(s)}$ (2787b)

$-Y_{8,2}^{(s)}$ (2788a)

$-Y_{8,2}^{(c)}$ (2788b)

$-Y_{8,1}^{(c)}$ (2789a)

$-Y_{8,1}^{(s)}$ (2789b)

18.3.9 $E : l = 9$

$-Y_{9,1}^{(s)}$ (2790a)

$Y_{9,1}^{(c)}$ (2790b)

$-Y_{9,7}^{(s)}$ (2791a)

$Y_{9,7}^{(c)}$ (2791b)

$-Y_{9,4}^{(c)}$ (2792a)

$-Y_{9,4}^{(s)}$ (2792b)

$Y_{9,2}^{(c)}$ (2793a)

$-Y_{9,2}^{(s)}$ (2793b)

$Y_{9,8}^{(c)}$ (2794a)

$-Y_{9,8}^{(s)}$ (2794b)

$-Y_{9,5}^{(s)}$ (2795a)

$-Y_{9,5}^{(c)}$ (2795b)

18.3.10 $E : l = 10$

$Y_{10,5}^{(c)}$ (2796a)

$-Y_{10,5}^{(s)}$ (2796b)

$-Y_{10,4}^{(s)}$ (2797a)

$Y_{10,4}^{(c)}$ (2797b)

$Y_{10,1}^{(c)}$ (2798a)

$Y_{10,1}^{(s)}$ (2798b)

$Y_{10,8}^{(s)}$ (2799a)

$Y_{10,8}^{(c)}$ (2799b)

$-Y_{10,10}^{(s)}$ (2800a)

$Y_{10,10}^{(c)}$ (2800b)

$-Y_{10,7}^{(c)}$ (2801a)

$-Y_{10,7}^{(s)}$ (2801b)

$Y_{10,2}^{(s)}$ (2802a)

$Y_{10,2}^{(c)}$ (2802b)

18.3.11 $E : l = 11$

$-Y_{11,7}^{(s)}$ (2803a)

$Y_{11,7}^{(c)}$ (2803b)

$Y_{11,8}^{(c)}$ (2804a)

$-Y_{11,8}^{(s)}$ (2804b)

$Y_{11,4}^{(c)}$ (2805a)

$Y_{11,4}^{(s)}$ (2805b)

$Y_{11,10}^{(c)}$ (2806a)

$Y_{11,10}^{(s)}$ (2806b)

$Y_{11,2}^{(c)}$ (2807a)

$-Y_{11,2}^{(s)}$ (2807b)

$-Y_{11,1}^{(s)}$ (2808a)

$Y_{11,1}^{(c)}$ (2808b)

$Y_{11,11}^{(s)}$ (2809a)

$Y_{11,11}^{(c)}$ (2809b)

$Y_{11,5}^{(s)}$ (2810a)

$Y_{11,5}^{(c)}$ (2810b)

18.3.12 $E : l = 12$

$Y_{12,2}^{(s)}$ (2811a)

$Y_{12,2}^{(c)}$ (2811b)

$Y_{12,5}^{(c)}$ (2812a)

$-Y_{12,5}^{(s)}$ (2812b)

$-Y_{12,10}^{(s)}$ (2813a)

$Y_{12,10}^{(c)}$ (2813b)

$Y_{12,11}^{(c)}$ (2814a)

$-Y_{12,11}^{(s)}$ (2814b)

$-Y_{12,4}^{(s)}$ (2815a)

$Y_{12,4}^{(c)}$ (2815b)

$-Y_{12,8}^{(s)}$ (2816a)

$-Y_{12,8}^{(c)}$ (2816b)

$Y_{12,7}^{(c)}$ (2817a)

$Y_{12,7}^{(s)}$ (2817b)

$-Y_{12,1}^{(c)}$ (2818a)

$-Y_{12,1}^{(s)}$ (2818b)

19 Group C_{3v}

19.1 A_1

19.1.1 $A_1 : l = 0$

$$Y_{0,0}^{(c)} \tag{2819a}$$

19.1.2 $A_1 : l = 1$

$$Y_{1,0}^{(c)} \tag{2820a}$$

19.1.3 $A_1 : l = 2$

$$Y_{2,0}^{(c)} \tag{2821a}$$

19.1.4 $A_1 : l = 3$

$$Y_{3,3}^{(c)} \tag{2822a}$$

$$Y_{3,0}^{(c)} \tag{2823a}$$

19.1.5 $A_1 : l = 4$

$$Y_{4,0}^{(c)} \tag{2824a}$$

$$Y_{4,3}^{(c)} \tag{2825a}$$

19.1.6 $A_1 : l = 5$

$$Y_{5,3}^{(c)} \tag{2826a}$$

$$Y_{5,0}^{(c)} \tag{2827a}$$

19.1.7 $A_1 : l = 6$

$$Y_{6,6}^{(c)} \tag{2828a}$$

$$Y_{6,3}^{(c)} \tag{2829a}$$

$$Y_{6,0}^{(c)} \tag{2830a}$$

19.1.8 $A_1 : l = 7$

$$Y_{7,6}^{(c)} \tag{2831a}$$

$$Y_{7,0}^{(c)} \tag{2832a}$$

$$Y_{7,3}^{(c)} \tag{2833a}$$

19.1.9 $A_1 : l = 8$

$$Y_{8,6}^{(c)} \tag{2834a}$$

$$Y_{8,0}^{(c)} \tag{2835a}$$

$$Y_{8,3}^{(c)} \tag{2836a}$$

19.1.10 $A_1 : l = 9$

$$Y_{9,0}^{(c)} \tag{2837a}$$

$$Y_{9,6}^{(c)} \tag{2838a}$$

$$Y_{9,3}^{(c)} \tag{2839a}$$

$$Y_{9,9}^{(c)} \tag{2840a}$$

19.1.11 $A_1 : l = 10$

$$Y_{10,6}^{(c)} \tag{2841a}$$

$$Y_{10,9}^{(c)} \tag{2842a}$$

$$Y_{10,3}^{(c)} \tag{2843a}$$

$$Y_{10,0}^{(c)} \tag{2844a}$$

19.1.12 $A_1 : l = 11$

$$Y_{11,3}^{(c)} \tag{2845a}$$

$$Y_{11,6}^{(c)} \tag{2846a}$$

$$Y_{11,9}^{(c)} \tag{2847a}$$

$$Y_{11,0}^{(c)} \tag{2848a}$$

19.1.13 $A_1 : l = 12$

$$Y_{12,9}^{(c)} \tag{2849a}$$

$$Y_{12,6}^{(c)} \tag{2850a}$$

$$Y_{12,0}^{(c)} \tag{2851a}$$

$$Y_{12,3}^{(c)} \tag{2852a}$$

$$Y_{12,12}^{(c)} \tag{2853a}$$

19.2 A_2

19.2.1 $A_2 : l = 3$

$$-Y_{3,3}^{(s)} \tag{2854a}$$

19.2.2 $A_2 : l = 4$

$$-Y_{4,3}^{(s)} \tag{2855a}$$

19.2.3 $A_2 : l = 5$

$$-Y_{5,3}^{(s)} \tag{2856a}$$

19.2.4 $A_2 : l = 6$

$$-Y_{6,6}^{(s)} \tag{2857a}$$

$$-Y_{6,3}^{(s)} \tag{2858a}$$

19.2.5 $A_2 : l = 7$

$$-Y_{7,3}^{(s)} \tag{2859a}$$

$$-Y_{7,6}^{(s)} \tag{2860a}$$

19.2.6 $A_2 : l = 8$

$$-Y_{8,6}^{(s)} \tag{2861a}$$

$$-Y_{8,3}^{(s)} \tag{2862a}$$

19.2.7 $A_2 : l = 9$

$$-Y_{9,9}^{(s)} \tag{2863a}$$

$$-Y_{9,6}^{(s)} \tag{2864a}$$

$$-Y_{9,3}^{(s)} \tag{2865a}$$

19.2.8 $A_2 : l = 10$

$$-Y_{10,3}^{(s)} \tag{2866a}$$

$$-Y_{10,9}^{(s)} \tag{2867a}$$

$$-Y_{10,6}^{(s)} \tag{2868a}$$

19.2.9 $A_2 : l = 11$

$$-Y_{11,9}^{(s)} \tag{2869a}$$

$$-Y_{11,3}^{(s)} \tag{2870a}$$

$$-Y_{11,6}^{(s)} \tag{2871a}$$

19.2.10 $A_2 : l = 12$

$$-Y_{12,12}^{(s)} \tag{2872a}$$

$$-Y_{12,3}^{(s)} \tag{2873a}$$

$$-Y_{12,9}^{(s)} \tag{2874a}$$

$$-Y_{12,6}^{(s)} \tag{2875a}$$

19.3 E

19.3.1 $E : l = 1$

$$-Y_{1,1}^{(s)} \tag{2876a}$$

$$Y_{1,1}^{(c)} \tag{2876b}$$

19.3.2 $E : l = 2$

$$Y_{2,2}^{(s)} \tag{2877a}$$

$$Y_{2,2}^{(c)} \tag{2877b}$$

$$-Y_{2,1}^{(s)} \tag{2878a}$$

$$Y_{2,1}^{(c)} \tag{2878b}$$

19.3.3 $E : l = 3$

$$-Y_{3,1}^{(s)} \tag{2879a}$$

$$Y_{3,1}^{(c)} \tag{2879b}$$

$$-Y_{3,2}^{(s)} \tag{2880a}$$

$$-Y_{3,2}^{(c)} \tag{2880b}$$

19.3.4 $E : l = 4$

$$-Y_{4,2}^{(s)} \tag{2881a}$$

$$-Y_{4,2}^{(c)} \tag{2881b}$$

$$-Y_{4,1}^{(s)} \tag{2882a}$$

$$Y_{4,1}^{(c)} \tag{2882b}$$

$$-Y_{4,4}^{(s)} \tag{2883a}$$

$$Y_{4,4}^{(c)} \tag{2883b}$$

19.3.5 $E : l = 5$

$$Y_{5,5}^{(s)} \tag{2884a}$$

$$Y_{5,5}^{(c)} \tag{2884b}$$

$$-Y_{5,4}^{(s)} \tag{2885a}$$

$$Y_{5,4}^{(c)} \tag{2885b}$$

$$-Y_{5,1}^{(s)} \tag{2886a}$$

$$Y_{5,1}^{(c)} \tag{2886b}$$

$$-Y_{5,2}^{(s)} \tag{2887a}$$

$$-Y_{5,2}^{(c)} \tag{2887b}$$

19.3.6 $E : l = 6$

$$-Y_{6,4}^{(s)} \tag{2888a}$$

$$Y_{6,4}^{(c)} \tag{2888b}$$

$$-Y_{6,5}^{(s)} \tag{2889a}$$

$$-Y_{6,5}^{(c)} \tag{2889b}$$

$$Y_{6,2}^{(s)} \tag{2890a}$$

$$Y_{6,2}^{(c)} \tag{2890b}$$

$$-Y_{6,1}^{(s)} \tag{2891a}$$

$$Y_{6,1}^{(c)} \tag{2891b}$$

19.3.7 $E : l = 7$

$-Y_{7,2}^{(s)}$ (2892a)

$-Y_{7,2}^{(c)}$ (2892b)

$-Y_{7,1}^{(s)}$ (2893a)

$Y_{7,1}^{(c)}$ (2893b)

$-Y_{7,4}^{(s)}$ (2894a)

$Y_{7,4}^{(c)}$ (2894b)

$-Y_{7,5}^{(s)}$ (2895a)

$-Y_{7,5}^{(c)}$ (2895b)

$-Y_{7,7}^{(s)}$ (2896a)

$Y_{7,7}^{(c)}$ (2896b)

19.3.8 $E : l = 8$

$-Y_{8,4}^{(s)}$ (2897a)

$Y_{8,4}^{(c)}$ (2897b)

$-Y_{8,5}^{(s)}$ (2898a)

$-Y_{8,5}^{(c)}$ (2898b)

$-Y_{8,8}^{(s)}$ (2899a)

$-Y_{8,8}^{(c)}$ (2899b)

$-Y_{8,2}^{(s)}$ (2900a)

$-Y_{8,2}^{(c)}$ (2900b)

$-Y_{8,7}^{(s)}$ (2901a)

$Y_{8,7}^{(c)}$ (2901b)

$-Y_{8,1}^{(s)}$ (2902a)

$Y_{8,1}^{(c)}$ (2902b)

19.3.9 $E : l = 9$

$-Y_{9,1}^{(s)}$ (2903a)

$Y_{9,1}^{(c)}$ (2903b)

$-Y_{9,2}^{(s)}$ (2904a)

$-Y_{9,2}^{(c)}$ (2904b)

$-Y_{9,7}^{(s)}$ (2905a)

$Y_{9,7}^{(c)}$ (2905b)

$-Y_{9,8}^{(s)}$ (2906a)

$-Y_{9,8}^{(c)}$ (2906b)

$-Y_{9,4}^{(s)}$ (2907a)

$Y_{9,4}^{(c)}$ (2907b)

$-Y_{9,5}^{(s)}$ (2908a)

$-Y_{9,5}^{(c)}$ (2908b)

19.3.10 $E : l = 10$

$-Y_{10,1}^{(s)}$ (2909a)

$Y_{10,1}^{(c)}$ (2909b)

$Y_{10,5}^{(s)}$ (2910a)

$Y_{10,5}^{(c)}$ (2910b)

$-Y_{10,4}^{(s)}$ (2911a)

$Y_{10,4}^{(c)}$ (2911b)

$Y_{10,8}^{(s)}$ (2912a)

$Y_{10,8}^{(c)}$ (2912b)

$-Y_{10,10}^{(s)}$ (2913a)

$Y_{10,10}^{(c)}$ (2913b)

$-Y_{10,7}^{(s)}$ (2914a)

$Y_{10,7}^{(c)}$ (2914b)

$Y_{10,2}^{(s)}$ (2915a)

$Y_{10,2}^{(c)}$ (2915b)

19.3.11 $E : l = 11$

$-Y_{11,4}^{(s)}$ (2916a)

$Y_{11,4}^{(c)}$ (2916b)

$-Y_{11,2}^{(s)}$ (2917a)

$-Y_{11,2}^{(c)}$ (2917b)

$-Y_{11,1}^{(s)}$ (2918a)

$Y_{11,1}^{(c)}$ (2918b)

$-Y_{11,10}^{(s)}$ (2919a)

$Y_{11,10}^{(c)}$ (2919b)

$Y_{11,8}^{(s)}$ (2920a)

$Y_{11,8}^{(c)}$ (2920b)

$-Y_{11,7}^{(s)}$ (2921a)

$Y_{11,7}^{(c)}$ (2921b)

$Y_{11,11}^{(s)}$ (2922a)

$Y_{11,11}^{(c)}$ (2922b)

$-Y_{11,5}^{(s)}$ (2923a)

$-Y_{11,5}^{(c)}$ (2923b)

19.3.12 $E : l = 12$

$Y_{12,2}^{(s)}$ (2924a)

$Y_{12,2}^{(c)}$ (2924b)

$Y_{12,5}^{(s)}$ (2925a)

$Y_{12,5}^{(c)}$ (2925b)

$-Y_{12,7}^{(s)}$ (2926a)

$Y_{12,7}^{(c)}$ (2926b)

$-Y_{12,1}^{(s)}$ (2927a)

$Y_{12,1}^{(c)}$ (2927b)

$Y_{12,11}^{(s)}$ (2928a)

$Y_{12,11}^{(c)}$ (2928b)

$-Y_{12,10}^{(s)}$ (2929a)

$Y_{12,10}^{(c)}$ (2929b)

$Y_{12,8}^{(s)}$ (2930a)

$Y_{12,8}^{(c)}$ (2930b)

$-Y_{12,4}^{(s)}$ (2931a)

$Y_{12,4}^{(c)}$ (2931b)

20   Group D_{3d}

20.1 A_{1g}

20.1.1 $A_{1g} : l = 0$

$$Y_{0,0}^{(c)} \tag{2932a}$$

20.1.2 $A_{1g} : l = 2$

$$Y_{2,0}^{(c)} \tag{2933a}$$

20.1.3 $A_{1g} : l = 4$

$$Y_{4,0}^{(c)} \tag{2934a}$$

$$-Y_{4,3}^{(s)} \tag{2935a}$$

20.1.4 $A_{1g} : l = 6$

$$-Y_{6,3}^{(s)} \tag{2936a}$$

$$Y_{6,6}^{(c)} \tag{2937a}$$

$$Y_{6,0}^{(c)} \tag{2938a}$$

20.1.5 $A_{1g} : l = 8$

$$Y_{8,6}^{(c)} \tag{2939a}$$

$$Y_{8,0}^{(c)} \tag{2940a}$$

$$-Y_{8,3}^{(s)} \tag{2941a}$$

20.1.6 $A_{1g} : l = 10$

$$-Y_{10,3}^{(s)} \tag{2942a}$$

$$Y_{10,6}^{(c)} \tag{2943a}$$

$$-Y_{10,9}^{(s)} \tag{2944a}$$

$$Y_{10,0}^{(c)} \tag{2945a}$$

20.1.7 $A_{1g} : l = 12$

$$Y_{12,6}^{(c)} \tag{2946a}$$

$$-Y_{12,3}^{(s)} \tag{2947a}$$

$$Y_{12,0}^{(c)} \tag{2948a}$$

$$Y_{12,12}^{(c)} \tag{2949a}$$

$$-Y_{12,9}^{(s)} \tag{2950a}$$

20.2 A_{1u}

20.2.1 $A_{1u} : l = 3$

$$Y_{3,3}^{(c)} \tag{2951a}$$

20.2.2 $A_{1u} : l = 5$

$$Y_{5,3}^{(c)} \tag{2952a}$$

20.2.3 $A_{1u} : l = 7$

$$Y_{7,3}^{(c)} \tag{2953a}$$

$$-Y_{7,6}^{(s)} \tag{2954a}$$

20.2.4 $A_{1u} : l = 9$

$$Y_{9,9}^{(c)} \tag{2955a}$$

$$Y_{9,3}^{(c)} \tag{2956a}$$

$$-Y_{9,6}^{(s)} \tag{2957a}$$

20.2.5 $A_{1u} : l = 11$

$$Y_{11,3}^{(c)} \tag{2958a}$$

$$-Y_{11,6}^{(s)} \tag{2959a}$$

$$Y_{11,9}^{(c)} \tag{2960a}$$

20.3 A_{2u}

20.3.1 $A_{2u} : l = 1$

$$Y_{1,0}^{(c)} \tag{2961a}$$

20.3.2 $A_{2u} : l = 3$

$$-Y_{3,3}^{(s)} \tag{2962a}$$

$$Y_{3,0}^{(c)} \tag{2963a}$$

20.3.3 $A_{2u} : l = 5$

$$-Y_{5,3}^{(s)} \tag{2964a}$$

$$Y_{5,0}^{(c)} \tag{2965a}$$

20.3.4 $A_{2u} : l = 7$

$$Y_{7,6}^{(c)} \tag{2966a}$$

$$-Y_{7,3}^{(s)} \tag{2967a}$$

$$Y_{7,0}^{(c)} \tag{2968a}$$

20.3.5 $A_{2u} : l = 9$

$$-Y_{9,3}^{(s)} \tag{2969a}$$

$$Y_{9,0}^{(c)} \tag{2970a}$$

$$Y_{9,6}^{(c)} \tag{2971a}$$

$$-Y_{9,9}^{(s)} \tag{2972a}$$

20.3.6 $A_{2u} : l = 11$

$$Y_{11,6}^{(c)} \tag{2973a}$$

$$-Y_{11,9}^{(s)} \tag{2974a}$$

$$-Y_{11,3}^{(s)} \tag{2975a}$$

$$Y_{11,0}^{(c)} \tag{2976a}$$

20.4 A_{2g}

20.4.1 $A_{2g} : l = 4$

$$Y_{4,3}^{(c)} \tag{2977a}$$

20.4.2 $A_{2g} : l = 6$

$$-Y_{6,6}^{(s)} \tag{2978a}$$

$$Y_{6,3}^{(c)} \tag{2979a}$$

20.4.3 $A_{2g} : l = 8$

$$-Y_{8,6}^{(s)} \tag{2980a}$$

$$Y_{8,3}^{(c)} \tag{2981a}$$

20.4.4 $A_{2g} : l = 10$

$$Y_{10,9}^{(c)} \tag{2982a}$$

$$Y_{10,3}^{(c)} \tag{2983a}$$

$$-Y_{10,6}^{(s)} \tag{2984a}$$

20.4.5 $A_{2g} : l = 12$

$$-Y_{12,12}^{(s)} \tag{2985a}$$

$$Y_{12,9}^{(c)} \tag{2986a}$$

$$Y_{12,3}^{(c)} \tag{2987a}$$

$$-Y_{12,6}^{(s)} \tag{2988a}$$

20.5 E_g

20.5.1 $E_g : l = 2$

$$-Y_{2,1}^{(s)} \tag{2989a}$$

$$Y_{2,1}^{(c)} \tag{2989b}$$

$$Y_{2,2}^{(c)} \tag{2990a}$$

$$-Y_{2,2}^{(s)} \tag{2990b}$$

20.5.2 $E_g : l = 4$

$$Y_{4,2}^{(c)} \tag{2991a}$$

$$-Y_{4,2}^{(s)} \tag{2991b}$$

$$-Y_{4,1}^{(s)} \tag{2992a}$$

$$Y_{4,1}^{(c)} \tag{2992b}$$

$$-Y_{4,4}^{(c)} \tag{2993a}$$

$$-Y_{4,4}^{(s)} \tag{2993b}$$

20.5.3 $E_g : l = 6$

$$-Y_{6,4}^{(c)} \tag{2994a}$$

$$-Y_{6,4}^{(s)} \tag{2994b}$$

$$-Y_{6,1}^{(s)} \tag{2995a}$$

$$Y_{6,1}^{(c)} \tag{2995b}$$

$$Y_{6,5}^{(s)} \tag{2996a}$$

$$Y_{6,5}^{(c)} \tag{2996b}$$

$$Y_{6,2}^{(c)} \tag{2997a}$$

$$-Y_{6,2}^{(s)} \tag{2997b}$$

20.5.4 $E_g : l = 8$

$$-Y_{8,7}^{(s)} \tag{2998a}$$

$$Y_{8,7}^{(c)} \tag{2998b}$$

$$-Y_{8,1}^{(s)} \tag{2999a}$$

$$Y_{8,1}^{(c)} \tag{2999b}$$

$$-Y_{8,5}^{(s)} \tag{3000a}$$

$$-Y_{8,5}^{(c)} \tag{3000b}$$

$$Y_{8,2}^{(c)} \tag{3001a}$$

$$-Y_{8,2}^{(s)} \tag{3001b}$$

$$Y_{8,4}^{(c)} \tag{3002a}$$

$$Y_{8,4}^{(s)} \tag{3002b}$$

$$Y_{8,8}^{(c)} \tag{3003a}$$

$$-Y_{8,8}^{(s)} \tag{3003b}$$

20.5.5 $E_g : l = 10$

$-Y_{10,7}^{(s)}$	(3004a)
$Y_{10,7}^{(c)}$	(3004b)

$-Y_{10,1}^{(s)}$	(3005a)
$Y_{10,1}^{(c)}$	(3005b)

$-Y_{10,4}^{(c)}$	(3006a)
$-Y_{10,4}^{(s)}$	(3006b)

$-Y_{10,10}^{(c)}$	(3007a)
$-Y_{10,10}^{(s)}$	(3007b)

$-Y_{10,5}^{(s)}$	(3008a)
$-Y_{10,5}^{(c)}$	(3008b)

$Y_{10,8}^{(c)}$	(3009a)
$-Y_{10,8}^{(s)}$	(3009b)

$Y_{10,2}^{(c)}$	(3010a)
$-Y_{10,2}^{(s)}$	(3010b)

20.5.6 $E_g : l = 12$

$-Y_{12,11}^{(s)}$	(3011a)
$-Y_{12,11}^{(c)}$	(3011b)

$-Y_{12,1}^{(s)}$	(3012a)
$Y_{12,1}^{(c)}$	(3012b)

$Y_{12,2}^{(c)}$	(3013a)
$-Y_{12,2}^{(s)}$	(3013b)

$Y_{12,4}^{(c)}$	(3014a)
$Y_{12,4}^{(s)}$	(3014b)

$Y_{12,5}^{(s)}$	(3015a)
$Y_{12,5}^{(c)}$	(3015b)

$Y_{12,8}^{(c)}$	(3016a)
$-Y_{12,8}^{(s)}$	(3016b)

$-Y_{12,10}^{(c)}$	(3017a)
$-Y_{12,10}^{(s)}$	(3017b)

$-Y_{12,7}^{(s)}$	(3018a)
$Y_{12,7}^{(c)}$	(3018b)

20.6 E_u

20.6.1 $E_u : l = 1$

$-Y_{1,1}^{(s)}$	(3019a)
$Y_{1,1}^{(c)}$	(3019b)

20.6.2 $E_u : l = 3$

$Y_{3,2}^{(c)}$	(3020a)
$-Y_{3,2}^{(s)}$	(3020b)

$-Y_{3,1}^{(s)}$	(3021a)
$Y_{3,1}^{(c)}$	(3021b)

20.6.3 $E_u : l = 5$

$Y_{5,2}^{(c)}$	(3022a)
$-Y_{5,2}^{(s)}$	(3022b)

$Y_{5,4}^{(c)}$	(3023a)
$Y_{5,4}^{(s)}$	(3023b)

$-Y_{5,1}^{(s)}$	(3024a)
$Y_{5,1}^{(c)}$	(3024b)

$Y_{5,5}^{(s)}$	(3025a)
$Y_{5,5}^{(c)}$	(3025b)

20.6.4 $E_u : l = 7$

$-Y_{7,4}^{(c)}$	(3026a)
$-Y_{7,4}^{(s)}$	(3026b)

$-Y_{7,5}^{(s)}$	(3027a)
$-Y_{7,5}^{(c)}$	(3027b)

$-Y_{7,7}^{(s)}$	(3028a)
$Y_{7,7}^{(c)}$	(3028b)

$-Y_{7,1}^{(s)}$	(3029a)
$Y_{7,1}^{(c)}$	(3029b)

$Y_{7,2}^{(c)}$	(3030a)
$-Y_{7,2}^{(s)}$	(3030b)

20.6.5 $E_u : l = 9$

$-Y_{9,5}^{(s)}$	(3031a)
$-Y_{9,5}^{(c)}$	(3031b)

$Y_{9,2}^{(c)}$	(3032a)
$-Y_{9,2}^{(s)}$	(3032b)

$Y_{9,8}^{(c)}$	(3033a)
$-Y_{9,8}^{(s)}$	(3033b)

$-Y_{9,7}^{(s)}$	(3034a)
$Y_{9,7}^{(c)}$	(3034b)

$Y_{9,4}^{(c)}$	(3035a)
$Y_{9,4}^{(s)}$	(3035b)

$-Y_{9,1}^{(s)}$	(3036a)
$Y_{9,1}^{(c)}$	(3036b)

20.6.6 $E_u : l = 11$

$Y_{11,10}^{(c)}$	(3037a)
$Y_{11,10}^{(s)}$	(3037b)

$-Y_{11,5}^{(s)}$	(3038a)
$-Y_{11,5}^{(c)}$	(3038b)

$Y_{11,2}^{(c)}$	(3039a)
$-Y_{11,2}^{(s)}$	(3039b)

$-Y_{11,1}^{(s)}$	(3040a)
$Y_{11,1}^{(c)}$	(3040b)

$Y_{11,4}^{(c)}$	(3041a)
$Y_{11,4}^{(s)}$	(3041b)

$-Y_{11,7}^{(s)}$	(3042a)
$Y_{11,7}^{(c)}$	(3042b)

$-Y_{11,11}^{(s)}$	(3043a)
$-Y_{11,11}^{(c)}$	(3043b)

$Y_{11,8}^{(c)}$	(3044a)
$-Y_{11,8}^{(s)}$	(3044b)

21 Group C_6

21.1 A

21.1.1 $A : l = 0$

$$Y_{0,0}^{(c)} \tag{3045a}$$

21.1.2 $A : l = 1$

$$Y_{1,0}^{(c)} \tag{3046a}$$

21.1.3 $A : l = 2$

$$Y_{2,0}^{(c)} \tag{3047a}$$

21.1.4 $A : l = 3$

$$Y_{3,0}^{(c)} \tag{3048a}$$

21.1.5 $A : l = 4$

$$Y_{4,0}^{(c)} \tag{3049a}$$

21.1.6 $A : l = 5$

$$Y_{5,0}^{(c)} \tag{3050a}$$

21.1.7 $A : l = 6$

$$-Y_{6,6}^{(s)} \tag{3051a}$$

$$Y_{6,6}^{(c)} \tag{3052a}$$

$$Y_{6,0}^{(c)} \tag{3053a}$$

21.1.8 $A : l = 7$

$$Y_{7,6}^{(c)} \tag{3054a}$$

$$Y_{7,0}^{(c)} \tag{3055a}$$

$$-Y_{7,6}^{(s)} \tag{3056a}$$

21.1.9 $A : l = 8$

$$Y_{8,6}^{(c)} \tag{3057a}$$

$$Y_{8,0}^{(c)} \tag{3058a}$$

$$-Y_{8,6}^{(s)} \tag{3059a}$$

21.1.10 $A : l = 9$

$$Y_{9,0}^{(c)} \tag{3060a}$$

$$Y_{9,6}^{(c)} \tag{3061a}$$

$$-Y_{9,6}^{(s)} \tag{3062a}$$

21.1.11 $A : l = 10$

$$Y_{10,6}^{(c)} \tag{3063a}$$

$$Y_{10,0}^{(c)} \tag{3064a}$$

$$-Y_{10,6}^{(s)} \tag{3065a}$$

21.1.12 $A : l = 11$

$$Y_{11,6}^{(c)} \tag{3066a}$$

$$-Y_{11,6}^{(s)} \tag{3067a}$$

$$Y_{11,0}^{(c)} \tag{3068a}$$

21.1.13 $A : l = 12$

$$Y_{12,6}^{(c)} \tag{3069a}$$

$$-Y_{12,12}^{(s)} \tag{3070a}$$

$$-Y_{12,6}^{(s)} \tag{3071a}$$

$$Y_{12,0}^{(c)} \tag{3072a}$$

$$Y_{12,12}^{(c)} \tag{3073a}$$

21.2 B

21.2.1 $B : l = 3$

$$Y_{3,3}^{(c)} \tag{3074a}$$

$$-Y_{3,3}^{(s)} \tag{3075a}$$

21.2.2 $B : l = 4$

$$Y_{4,3}^{(c)} \tag{3076a}$$

$$-Y_{4,3}^{(s)} \tag{3077a}$$

21.2.3 $B : l = 5$

$$-Y_{5,3}^{(s)} \tag{3078a}$$

$$Y_{5,3}^{(c)} \tag{3079a}$$

21.2.4 $B : l = 6$

$$-Y_{6,3}^{(s)} \tag{3080a}$$

$$Y_{6,3}^{(c)} \tag{3081a}$$

21.2.5 $B : l = 7$

$$-Y_{7,3}^{(s)} \tag{3082a}$$

$$Y_{7,3}^{(c)} \tag{3083a}$$

21.2.6 $B : l = 8$

$$-Y_{8,3}^{(s)} \tag{3084a}$$

$$Y_{8,3}^{(c)} \tag{3085a}$$

21.2.7 $B : l = 9$

$$-Y_{9,9}^{(s)} \tag{3086a}$$

$$Y_{9,9}^{(c)} \tag{3087a}$$

$$-Y_{9,3}^{(s)} \tag{3088a}$$

$$Y_{9,3}^{(c)} \tag{3089a}$$

21.2.8 $B : l = 10$

$$-Y_{10,3}^{(s)} \tag{3090a}$$

$$Y_{10,9}^{(c)} \tag{3091a}$$

$$-Y_{10,9}^{(s)} \tag{3092a}$$

$$Y_{10,3}^{(c)} \tag{3093a}$$

21.2.9 $B : l = 11$

$$Y_{11,3}^{(c)} \tag{3094a}$$

$$-Y_{11,9}^{(s)} \tag{3095a}$$

$$-Y_{11,3}^{(s)} \tag{3096a}$$

$$Y_{11,9}^{(c)} \tag{3097a}$$

21.2.10 $B : l = 12$

$$-Y_{12,3}^{(c)} \tag{3098a}$$

$$-Y_{12,9}^{(s)} \tag{3099a}$$

$$Y_{12,9}^{(c)} \tag{3100a}$$

$$Y_{12,3}^{(c)} \tag{3101a}$$

21.3 E'^1

21.3.1 $E'^1 : l = 1$

$$\frac{\sqrt{2}Y_{1,1}^{(c)}}{2} + \frac{\sqrt{2}iY_{1,1}^{(s)}}{2} \tag{3102a}$$

21.3.2 $E'^1 : l = 2$

$$\frac{\sqrt{2}iY_{2,1}^{(c)}}{2} - \frac{\sqrt{2}Y_{2,1}^{(s)}}{2} \tag{3103a}$$

21.3.3 $E'^1 : l = 3$

$$\frac{\sqrt{2}iY_{3,1}^{(c)}}{2} - \frac{\sqrt{2}Y_{3,1}^{(s)}}{2} \tag{3104a}$$

21.3.4 $E'^1 : l = 4$

$$\frac{\sqrt{2}Y_{4,1}^{(c)}}{2} + \frac{\sqrt{2}iY_{4,1}^{(s)}}{2} \tag{3105a}$$

21.3.5 $E'^1 : l = 5$

$$\frac{\sqrt{2}iY_{5,1}^{(c)}}{2} - \frac{\sqrt{2}Y_{5,1}^{(s)}}{2} \tag{3106a}$$

$$\frac{\sqrt{2}Y_{5,5}^{(c)}}{2} - \frac{\sqrt{2}iY_{5,5}^{(s)}}{2} \tag{3107a}$$

21.3.6 $E'^1 : l = 6$

$$\frac{\sqrt{2}Y_{6,1}^{(c)}}{2} + \frac{\sqrt{2}iY_{6,1}^{(s)}}{2} \tag{3108a}$$

$$\frac{\sqrt{2}Y_{6,5}^{(c)}}{2} - \frac{\sqrt{2}iY_{6,5}^{(s)}}{2} \tag{3109a}$$

21.3.7 $E'^1 : l = 7$

$$\frac{\sqrt{2}Y_{7,5}^{(c)}}{2} - \frac{\sqrt{2}iY_{7,5}^{(s)}}{2} \tag{3110a}$$

$$\frac{\sqrt{2}iY_{7,7}^{(c)}}{2} - \frac{\sqrt{2}Y_{7,7}^{(s)}}{2} \tag{3111a}$$

$$\frac{\sqrt{2}iY_{7,1}^{(c)}}{2} - \frac{\sqrt{2}Y_{7,1}^{(s)}}{2} \tag{3112a}$$

21.3.8 $E'^1 : l = 8$

$$\frac{\sqrt{2}Y_{8,7}^{(c)}}{2} + \frac{\sqrt{2}iY_{8,7}^{(s)}}{2} \tag{3113a}$$

$$-\frac{\sqrt{2}iY_{8,5}^{(c)}}{2} - \frac{\sqrt{2}Y_{8,5}^{(s)}}{2} \tag{3114a}$$

$$\frac{\sqrt{2}Y_{8,1}^{(c)}}{2} + \frac{\sqrt{2}iY_{8,1}^{(s)}}{2} \tag{3115a}$$

21.3.9 $E'^1 : l = 9$

$$\frac{\sqrt{2}Y_{9,5}^{(c)}}{2} - \frac{\sqrt{2}iY_{9,5}^{(s)}}{2} \tag{3116a}$$

$$\frac{\sqrt{2}iY_{9,1}^{(c)}}{2} - \frac{\sqrt{2}Y_{9,1}^{(s)}}{2} \tag{3117a}$$

$$\frac{\sqrt{2}iY_{9,7}^{(c)}}{2} - \frac{\sqrt{2}Y_{9,7}^{(s)}}{2} \tag{3118a}$$

21.3.10 $E'^1 : l = 10$

$$-\frac{\sqrt{2}iY_{10,5}^{(c)}}{2} - \frac{\sqrt{2}Y_{10,5}^{(s)}}{2} \tag{3119a}$$

$$\frac{\sqrt{2}Y_{10,1}^{(c)}}{2} + \frac{\sqrt{2}iY_{10,1}^{(s)}}{2} \tag{3120a}$$

$$\frac{\sqrt{2}Y_{10,7}^{(c)}}{2} + \frac{\sqrt{2}iY_{10,7}^{(s)}}{2} \tag{3121a}$$

21.3.11 $E'1 : l = 11$

$$\frac{\sqrt{2}Y_{11,11}^{(c)}}{2} - \frac{\sqrt{2}iY_{11,11}^{(s)}}{2}$$ (3122a)

$$-\frac{\sqrt{2}iY_{11,5}^{(c)}}{2} - \frac{\sqrt{2}Y_{11,5}^{(s)}}{2}$$ (3123a)

$$\frac{\sqrt{2}Y_{11,7}^{(c)}}{2} + \frac{\sqrt{2}iY_{11,7}^{(s)}}{2}$$ (3124a)

$$\frac{\sqrt{2}Y_{11,1}^{(c)}}{2} + \frac{\sqrt{2}iY_{11,1}^{(s)}}{2}$$ (3125a)

21.3.12 $E'1 : l = 12$

$$-\frac{\sqrt{2}iY_{12,11}^{(c)}}{2} - \frac{\sqrt{2}Y_{12,11}^{(s)}}{2}$$ (3126a)

$$\frac{\sqrt{2}iY_{12,1}^{(c)}}{2} - \frac{\sqrt{2}Y_{12,1}^{(s)}}{2}$$ (3127a)

$$\frac{\sqrt{2}iY_{12,7}^{(c)}}{2} - \frac{\sqrt{2}Y_{12,7}^{(s)}}{2}$$ (3128a)

$$-\frac{\sqrt{2}iY_{12,5}^{(c)}}{2} - \frac{\sqrt{2}Y_{12,5}^{(s)}}{2}$$ (3129a)

21.4 $E'2$

21.4.1 $E'2 : l = 1$

$$-\frac{\sqrt{2}iY_{1,1}^{(c)}}{2} - \frac{\sqrt{2}Y_{1,1}^{(s)}}{2}$$ (3130a)

21.4.2 $E'2 : l = 2$

$$\frac{\sqrt{2}Y_{2,1}^{(c)}}{2} - \frac{\sqrt{2}iY_{2,1}^{(s)}}{2}$$ (3131a)

21.4.3 $E'2 : l = 3$

$$-\frac{\sqrt{2}iY_{3,1}^{(c)}}{2} - \frac{\sqrt{2}Y_{3,1}^{(s)}}{2}$$ (3132a)

21.4.4 $E'2 : l = 4$

$$-\frac{\sqrt{2}iY_{4,1}^{(c)}}{2} - \frac{\sqrt{2}Y_{4,1}^{(s)}}{2}$$ (3133a)

21.4.5 $E'2 : l = 5$

$$-\frac{\sqrt{2}iY_{5,1}^{(c)}}{2} - \frac{\sqrt{2}Y_{5,1}^{(s)}}{2}$$ (3134a)

$$\frac{\sqrt{2}iY_{5,5}^{(c)}}{2} - \frac{\sqrt{2}Y_{5,5}^{(s)}}{2}$$ (3135a)

21.4.6 $E'2 : l = 6$

$$\frac{\sqrt{2}Y_{6,5}^{(c)}}{2} + \frac{\sqrt{2}iY_{6,5}^{(s)}}{2}$$ (3136a)

$$\frac{\sqrt{2}Y_{6,1}^{(c)}}{2} - \frac{\sqrt{2}iY_{6,1}^{(s)}}{2}$$ (3137a)

21.4.7 $E'2 : l = 7$

$$\frac{\sqrt{2}Y_{7,7}^{(c)}}{2} - \frac{\sqrt{2}iY_{7,7}^{(s)}}{2}$$ (3138a)

$$\frac{\sqrt{2}Y_{7,5}^{(c)}}{2} + \frac{\sqrt{2}iY_{7,5}^{(s)}}{2}$$ (3139a)

$$\frac{\sqrt{2}Y_{7,1}^{(c)}}{2} - \frac{\sqrt{2}iY_{7,1}^{(s)}}{2}$$ (3140a)

21.4.8 $E'2 : l = 8$

$$-\frac{\sqrt{2}iY_{8,1}^{(c)}}{2} - \frac{\sqrt{2}Y_{8,1}^{(s)}}{2}$$ (3141a)

$$\frac{\sqrt{2}iY_{8,5}^{(c)}}{2} - \frac{\sqrt{2}Y_{8,5}^{(s)}}{2}$$ (3142a)

$$\frac{\sqrt{2}Y_{8,7}^{(c)}}{2} - \frac{\sqrt{2}iY_{8,7}^{(s)}}{2}$$ (3143a)

21.4.9 $E'2 : l = 9$

$$\frac{\sqrt{2}Y_{9,5}^{(c)}}{2} + \frac{\sqrt{2}iY_{9,5}^{(s)}}{2}$$ (3144a)

$$\frac{\sqrt{2}Y_{9,7}^{(c)}}{2} - \frac{\sqrt{2}iY_{9,7}^{(s)}}{2}$$ (3145a)

$$-\frac{\sqrt{2}iY_{9,1}^{(c)}}{2} - \frac{\sqrt{2}Y_{9,1}^{(s)}}{2}$$ (3146a)

21.4.10 $E'2 : l = 10$

$$-\frac{\sqrt{2}iY_{10,1}^{(c)}}{2} - \frac{\sqrt{2}Y_{10,1}^{(s)}}{2}$$ (3147a)

$$\frac{\sqrt{2}Y_{10,5}^{(c)}}{2} + \frac{\sqrt{2}iY_{10,5}^{(s)}}{2}$$ (3148a)

$$\frac{\sqrt{2}Y_{10,7}^{(c)}}{2} - \frac{\sqrt{2}iY_{10,7}^{(s)}}{2}$$ (3149a)

21.4.11 $E'2 : l = 11$

$$\frac{\sqrt{2}Y_{11,7}^{(c)}}{2} - \frac{\sqrt{2}iY_{11,7}^{(s)}}{2}$$ (3150a)

$$\frac{\sqrt{2}Y_{11,11}^{(c)}}{2} + \frac{\sqrt{2}iY_{11,11}^{(s)}}{2}$$ (3151a)

$$\frac{\sqrt{2}Y_{11,5}^{(c)}}{2} + \frac{\sqrt{2}iY_{11,5}^{(s)}}{2}$$ (3152a)

$$-\frac{\sqrt{2}iY_{11,1}^{(c)}}{2} - \frac{\sqrt{2}Y_{11,1}^{(s)}}{2}$$ (3153a)

21.4.12 $E'2 : l = 12$

$$-\frac{\sqrt{2}iY_{12,7}^{(c)}}{2} - \frac{\sqrt{2}Y_{12,7}^{(s)}}{2}$$ (3154a)

$$\frac{\sqrt{2}Y_{12,5}^{(c)}}{2} + \frac{\sqrt{2}iY_{12,5}^{(s)}}{2}$$ (3155a)

$$-\frac{\sqrt{2}iY_{12,1}^{(c)}}{2} - \frac{\sqrt{2}Y_{12,1}^{(s)}}{2}$$ (3156a)

$$\frac{\sqrt{2}Y_{12,11}^{(c)}}{2} + \frac{\sqrt{2}iY_{12,11}^{(s)}}{2}$$ (3157a)

21.5 $E''2$

21.5.1 $E''2 : l = 2$

$$-\frac{\sqrt{2}iY_{2,2}^{(c)}}{2} - \frac{\sqrt{2}Y_{2,2}^{(s)}}{2}$$ (3158a)

21.5.2 $E''2 : l = 3$

$$\frac{\sqrt{2}Y_{3,2}^{(c)}}{2} - \frac{\sqrt{2}iY_{3,2}^{(s)}}{2}$$ (3159a)

21.5.3 $E''2 : l = 4$

$$-\frac{\sqrt{2}iY_{4,2}^{(c)}}{2} - \frac{\sqrt{2}Y_{4,2}^{(s)}}{2}$$ (3160a)

$$\frac{\sqrt{2}iY_{4,4}^{(c)}}{2} - \frac{\sqrt{2}Y_{4,4}^{(s)}}{2}$$ (3161a)

21.5.4 $E''2 : l = 5$

$$\frac{\sqrt{2}iY_{5,4}^{(c)}}{2} - \frac{\sqrt{2}Y_{5,4}^{(s)}}{2}$$ (3162a)

$$-\frac{\sqrt{2}iY_{5,2}^{(c)}}{2} - \frac{\sqrt{2}Y_{5,2}^{(s)}}{2}$$ (3163a)

21.5.5 $E''2 : l = 6$

$$\frac{\sqrt{2}iY_{6,4}^{(c)}}{2} - \frac{\sqrt{2}Y_{6,4}^{(s)}}{2}$$ (3164a)

$$\frac{\sqrt{2}Y_{6,2}^{(c)}}{2} - \frac{\sqrt{2}iY_{6,2}^{(s)}}{2}$$ (3165a)

21.5.6 $E''2 : l = 7$

$$-\frac{\sqrt{2}iY_{7,2}^{(c)}}{2} - \frac{\sqrt{2}Y_{7,2}^{(s)}}{2}$$ (3166a)

$$\frac{\sqrt{2}iY_{7,4}^{(c)}}{2} - \frac{\sqrt{2}Y_{7,4}^{(s)}}{2}$$ (3167a)

21.5.7 $E''2 : l = 8$

$$\frac{\sqrt{2}Y_{8,4}^{(c)}}{2} + \frac{\sqrt{2}iY_{8,4}^{(s)}}{2}$$ (3168a)

$$\frac{\sqrt{2}Y_{8,8}^{(c)}}{2} - \frac{\sqrt{2}iY_{8,8}^{(s)}}{2}$$ (3169a)

$$-\frac{\sqrt{2}iY_{8,2}^{(c)}}{2} - \frac{\sqrt{2}Y_{8,2}^{(s)}}{2}$$ (3170a)

21.5.8 $E''2 : l = 9$

$$\frac{\sqrt{2}Y_{9,2}^{(c)}}{2} - \frac{\sqrt{2}iY_{9,2}^{(s)}}{2}$$ (3171a)

$$\frac{\sqrt{2}Y_{9,4}^{(c)}}{2} + \frac{\sqrt{2}iY_{9,4}^{(s)}}{2}$$ (3172a)

$$\frac{\sqrt{2}Y_{9,8}^{(c)}}{2} - \frac{\sqrt{2}iY_{9,8}^{(s)}}{2}$$ (3173a)

21.5.9 $E''2 : l = 10$

$$\frac{\sqrt{2}Y_{10,8}^{(c)}}{2} - \frac{\sqrt{2}iY_{10,8}^{(s)}}{2}$$ (3174a)

$$\frac{\sqrt{2}Y_{10,2}^{(c)}}{2} - \frac{\sqrt{2}iY_{10,2}^{(s)}}{2}$$ (3175a)

$$\frac{\sqrt{2}iY_{10,4}^{(c)}}{2} - \frac{\sqrt{2}Y_{10,4}^{(s)}}{2}$$ (3176a)

$$\frac{\sqrt{2}iY_{10,10}^{(c)}}{2} - \frac{\sqrt{2}Y_{10,10}^{(s)}}{2}$$ (3177a)

21.5.10 $E''2 : l = 11$

$$\frac{\sqrt{2}iY_{11,4}^{(c)}}{2} - \frac{\sqrt{2}Y_{11,4}^{(s)}}{2}$$ (3178a)

$$-\frac{\sqrt{2}iY_{11,2}^{(c)}}{2} - \frac{\sqrt{2}Y_{11,2}^{(s)}}{2}$$ (3179a)

$$-\frac{\sqrt{2}iY_{11,8}^{(c)}}{2} - \frac{\sqrt{2}Y_{11,8}^{(s)}}{2}$$ (3180a)

$$\frac{\sqrt{2}iY_{11,10}^{(c)}}{2} - \frac{\sqrt{2}Y_{11,10}^{(s)}}{2}$$ (3181a)

21.5.11 $E''2 : l = 12$

$$\frac{\sqrt{2}iY_{12,4}^{(c)}}{2} - \frac{\sqrt{2}Y_{12,4}^{(s)}}{2}$$ (3182a)

$$\frac{\sqrt{2}Y_{12,8}^{(c)}}{2} - \frac{\sqrt{2}iY_{12,8}^{(s)}}{2}$$ (3183a)

$$\frac{\sqrt{2}Y_{12,10}^{(c)}}{2} + \frac{\sqrt{2}iY_{12,10}^{(s)}}{2}$$ (3184a)

$$-\frac{\sqrt{2}iY_{12,2}^{(c)}}{2} - \frac{\sqrt{2}Y_{12,2}^{(s)}}{2}$$ (3185a)

21.6 $E''1$

21.6.1 $E''1 : l = 2$

$$\frac{\sqrt{2}Y_{2,2}^{(c)}}{2} + \frac{\sqrt{2}iY_{2,2}^{(s)}}{2}$$ (3186a)

21.6.2 $E''1 : l = 3$

$$\frac{\sqrt{2}Y_{3,2}^{(c)}}{2} + \frac{\sqrt{2}iY_{3,2}^{(s)}}{2}$$ (3187a)

21.6.3 $E''1 : l = 4$

$$\frac{\sqrt{2}Y_{4,2}^{(c)}}{2} + \frac{\sqrt{2}iY_{4,2}^{(s)}}{2}$$ (3188a)

$$\frac{\sqrt{2}Y_{4,4}^{(c)}}{2} - \frac{\sqrt{2}iY_{4,4}^{(s)}}{2}$$ (3189a)

21.6.4 $E''1 : l = 5$

$$\frac{\sqrt{2}Y_{5,2}^{(c)}}{2} + \frac{\sqrt{2}iY_{5,2}^{(s)}}{2}$$ (3190a)

$$\frac{\sqrt{2}Y_{5,4}^{(c)}}{2} - \frac{\sqrt{2}iY_{5,4}^{(s)}}{2}$$ (3191a)

21.6.5 $E''1 : l = 6$

$$\frac{\sqrt{2}Y_{6,2}^{(c)}}{2} + \frac{\sqrt{2}iY_{6,2}^{(s)}}{2}$$ \hfill (3192a)

$$\frac{\sqrt{2}Y_{6,4}^{(c)}}{2} - \frac{\sqrt{2}iY_{6,4}^{(s)}}{2}$$ \hfill (3193a)

21.6.6 $E''1 : l = 7$

$$\frac{\sqrt{2}iY_{7,2}^{(c)}}{2} - \frac{\sqrt{2}Y_{7,2}^{(s)}}{2}$$ \hfill (3194a)

$$\frac{\sqrt{2}Y_{7,4}^{(c)}}{2} - \frac{\sqrt{2}iY_{7,4}^{(s)}}{2}$$ \hfill (3195a)

21.6.7 $E''1 : l = 8$

$$\frac{\sqrt{2}Y_{8,8}^{(c)}}{2} + \frac{\sqrt{2}iY_{8,8}^{(s)}}{2}$$ \hfill (3196a)

$$\frac{\sqrt{2}Y_{8,4}^{(c)}}{2} - \frac{\sqrt{2}iY_{8,4}^{(s)}}{2}$$ \hfill (3197a)

$$\frac{\sqrt{2}Y_{8,2}^{(c)}}{2} + \frac{\sqrt{2}iY_{8,2}^{(s)}}{2}$$ \hfill (3198a)

21.6.8 $E''1 : l = 9$

$$-\frac{\sqrt{2}iY_{9,4}^{(c)}}{2} - \frac{\sqrt{2}Y_{9,4}^{(s)}}{2}$$ \hfill (3199a)

$$\frac{\sqrt{2}iY_{9,8}^{(c)}}{2} - \frac{\sqrt{2}Y_{9,8}^{(s)}}{2}$$ \hfill (3200a)

$$\frac{\sqrt{2}Y_{9,2}^{(c)}}{2} + \frac{\sqrt{2}iY_{9,2}^{(s)}}{2}$$ \hfill (3201a)

21.6.9 $E''1 : l = 10$

$$\frac{\sqrt{2}Y_{10,2}^{(c)}}{2} + \frac{\sqrt{2}iY_{10,2}^{(s)}}{2}$$ \hfill (3202a)

$$\frac{\sqrt{2}Y_{10,4}^{(c)}}{2} - \frac{\sqrt{2}iY_{10,4}^{(s)}}{2}$$ \hfill (3203a)

$$\frac{\sqrt{2}Y_{10,10}^{(c)}}{2} - \frac{\sqrt{2}iY_{10,10}^{(s)}}{2}$$ \hfill (3204a)

$$\frac{\sqrt{2}iY_{10,8}^{(c)}}{2} - \frac{\sqrt{2}Y_{10,8}^{(s)}}{2}$$ \hfill (3205a)

21.6.10 $E''1 : l = 11$

$$\frac{\sqrt{2}Y_{11,8}^{(c)}}{2} + \frac{\sqrt{2}iY_{11,8}^{(s)}}{2}$$ \hfill (3206a)

$$-\frac{\sqrt{2}iY_{11,10}^{(c)}}{2} - \frac{\sqrt{2}Y_{11,10}^{(s)}}{2}$$ \hfill (3207a)

$$\frac{\sqrt{2}Y_{11,2}^{(c)}}{2} + \frac{\sqrt{2}iY_{11,2}^{(s)}}{2}$$ \hfill (3208a)

$$-\frac{\sqrt{2}iY_{11,4}^{(c)}}{2} - \frac{\sqrt{2}Y_{11,4}^{(s)}}{2}$$ \hfill (3209a)

21.6.11 $E''1 : l = 12$

$$\frac{\sqrt{2}Y_{12,4}^{(c)}}{2} - \frac{\sqrt{2}iY_{12,4}^{(s)}}{2}$$ \hfill (3210a)

$$-\frac{\sqrt{2}iY_{12,10}^{(c)}}{2} - \frac{\sqrt{2}Y_{12,10}^{(s)}}{2}$$ \hfill (3211a)

$$\frac{\sqrt{2}iY_{12,8}^{(c)}}{2} - \frac{\sqrt{2}Y_{12,8}^{(s)}}{2}$$ \hfill (3212a)

$$\frac{\sqrt{2}Y_{12,2}^{(c)}}{2} + \frac{\sqrt{2}iY_{12,2}^{(s)}}{2}$$ \hfill (3213a)

22   Group C_{3h}

22.1 A'

22.1.1 $A' : l = 0$

$$Y_{0,0}^{(c)} \tag{3214a}$$

22.1.2 $A' : l = 2$

$$Y_{2,0}^{(c)} \tag{3215a}$$

22.1.3 $A' : l = 3$

$$Y_{3,3}^{(c)} \tag{3216a}$$

$$-Y_{3,3}^{(s)} \tag{3217a}$$

22.1.4 $A' : l = 4$

$$Y_{4,0}^{(c)} \tag{3218a}$$

22.1.5 $A' : l = 5$

$$-Y_{5,3}^{(s)} \tag{3219a}$$

$$Y_{5,3}^{(c)} \tag{3220a}$$

22.1.6 $A' : l = 6$

$$-Y_{6,6}^{(s)} \tag{3221a}$$

$$Y_{6,6}^{(c)} \tag{3222a}$$

$$Y_{6,0}^{(c)} \tag{3223a}$$

22.1.7 $A' : l = 7$

$$-Y_{7,3}^{(s)} \tag{3224a}$$

$$Y_{7,3}^{(c)} \tag{3225a}$$

22.1.8 $A' : l = 8$

$$Y_{8,6}^{(c)} \tag{3226a}$$

$$Y_{8,0}^{(c)} \tag{3227a}$$

$$-Y_{8,6}^{(s)} \tag{3228a}$$

22.1.9 $A' : l = 9$

$$-Y_{9,9}^{(s)} \tag{3229a}$$

$$Y_{9,9}^{(c)} \tag{3230a}$$

$$-Y_{9,3}^{(s)} \tag{3231a}$$

$$Y_{9,3}^{(c)} \tag{3232a}$$

22.1.10 $A' : l = 10$

$$Y_{10,6}^{(c)} \tag{3233a}$$

$$Y_{10,0}^{(c)} \tag{3234a}$$

$$-Y_{10,6}^{(s)} \tag{3235a}$$

22.1.11 $A' : l = 11$

$$Y_{11,3}^{(c)} \tag{3236a}$$

$$-Y_{11,9}^{(s)} \tag{3237a}$$

$$-Y_{11,3}^{(s)} \tag{3238a}$$

$$Y_{11,9}^{(c)} \tag{3239a}$$

22.1.12 $A' : l = 12$

$$Y_{12,6}^{(c)} \tag{3240a}$$

$$-Y_{12,12}^{(s)} \tag{3241a}$$

$$-Y_{12,6}^{(s)} \tag{3242a}$$

$$Y_{12,0}^{(c)} \tag{3243a}$$

$$Y_{12,12}^{(c)} \tag{3244a}$$

22.2 A''

22.2.1 $A'' : l = 1$

$$Y_{1,0}^{(c)} \tag{3245a}$$

22.2.2 $A'' : l = 3$

$$Y_{3,0}^{(c)} \tag{3246a}$$

22.2.3 $A'' : l = 4$

$$Y_{4,3}^{(c)} \tag{3247a}$$

$$-Y_{4,3}^{(s)} \tag{3248a}$$

22.2.4 $A'' : l = 5$

$$Y_{5,0}^{(c)} \tag{3249a}$$

22.2.5 $A'' : l = 6$

$$-Y_{6,3}^{(s)} \tag{3250a}$$

$$Y_{6,3}^{(c)} \tag{3251a}$$

22.2.6 $A'' : l = 7$

$$Y_{7,6}^{(c)} \tag{3252a}$$

$$Y_{7,0}^{(c)} \tag{3253a}$$

$$-Y_{7,6}^{(s)} \tag{3254a}$$

22.2.7 $A'' : l = 8$

$$-Y_{8,3}^{(s)} \tag{3255a}$$

$$Y_{8,3}^{(c)} \tag{3256a}$$

22.2.8 $A'' : l = 9$

$$Y_{9,0}^{(c)} \tag{3257a}$$

$$Y_{9,6}^{(c)} \tag{3258a}$$

$$-Y_{9,6}^{(s)} \tag{3259a}$$

22.2.9 $A'' : l = 10$

$$-Y_{10,3}^{(s)} \tag{3260a}$$

$$Y_{10,9}^{(c)} \tag{3261a}$$

$$-Y_{10,9}^{(s)} \tag{3262a}$$

$$Y_{10,3}^{(c)} \tag{3263a}$$

22.2.10 $A'' : l = 11$

$$Y_{11,6}^{(c)} \tag{3264a}$$

$$-Y_{11,6}^{(s)} \tag{3265a}$$

$$Y_{11,0}^{(c)} \tag{3266a}$$

22.2.11 $A'' : l = 12$

$$-Y_{12,3}^{(s)} \tag{3267a}$$

$$-Y_{12,9}^{(s)} \tag{3268a}$$

$$Y_{12,9}^{(c)} \tag{3269a}$$

$$Y_{12,3}^{(c)} \tag{3270a}$$

22.3 $E''2$

22.3.1 $E''2 : l = 2$

$$\frac{\sqrt{2}Y_{2,1}^{(c)}}{2} - \frac{\sqrt{2}iY_{2,1}^{(s)}}{2} \tag{3271a}$$

22.3.2 $E''2 : l = 3$

$$\frac{\sqrt{2}iY_{3,2}^{(c)}}{2} - \frac{\sqrt{2}Y_{3,2}^{(s)}}{2} \tag{3272a}$$

22.3.3 $E''2 : l = 4$

$$-\frac{\sqrt{2}iY_{4,1}^{(c)}}{2} - \frac{\sqrt{2}Y_{4,1}^{(s)}}{2} \tag{3273a}$$

22.3.4 $E''2 : l = 5$

$$\frac{\sqrt{2}Y_{5,4}^{(c)}}{2} - \frac{\sqrt{2}iY_{5,4}^{(s)}}{2} \tag{3274a}$$

$$\frac{\sqrt{2}Y_{5,2}^{(c)}}{2} + \frac{\sqrt{2}iY_{5,2}^{(s)}}{2} \tag{3275a}$$

22.3.5 $E''2 : l = 6$

$$\frac{\sqrt{2}Y_{6,5}^{(c)}}{2} + \frac{\sqrt{2}iY_{6,5}^{(s)}}{2} \tag{3276a}$$

$$\frac{\sqrt{2}Y_{6,1}^{(c)}}{2} - \frac{\sqrt{2}iY_{6,1}^{(s)}}{2} \tag{3277a}$$

22.3.6 $E''2 : l = 7$

$$\frac{\sqrt{2}iY_{7,2}^{(c)}}{2} - \frac{\sqrt{2}Y_{7,2}^{(s)}}{2} \tag{3278a}$$

$$-\frac{\sqrt{2}iY_{7,4}^{(c)}}{2} - \frac{\sqrt{2}Y_{7,4}^{(s)}}{2} \tag{3279a}$$

22.3.7 $E''2 : l = 8$

$$-\frac{\sqrt{2}iY_{8,1}^{(c)}}{2} - \frac{\sqrt{2}Y_{8,1}^{(s)}}{2} \tag{3280a}$$

$$\frac{\sqrt{2}iY_{8,5}^{(c)}}{2} - \frac{\sqrt{2}Y_{8,5}^{(s)}}{2} \tag{3281a}$$

$$\frac{\sqrt{2}Y_{8,7}^{(c)}}{2} - \frac{\sqrt{2}iY_{8,7}^{(s)}}{2} \tag{3282a}$$

22.3.8 $E''2 : l = 9$

$$\frac{\sqrt{2}iY_{9,8}^{(c)}}{2} - \frac{\sqrt{2}Y_{9,8}^{(s)}}{2} \tag{3283a}$$

$$\frac{\sqrt{2}Y_{9,4}^{(c)}}{2} - \frac{\sqrt{2}iY_{9,4}^{(s)}}{2} \tag{3284a}$$

$$\frac{\sqrt{2}Y_{9,2}^{(c)}}{2} + \frac{\sqrt{2}iY_{9,2}^{(s)}}{2} \tag{3285a}$$

22.3.9 $E''2 : l = 10$

$$-\frac{\sqrt{2}iY_{10,1}^{(c)}}{2} - \frac{\sqrt{2}Y_{10,1}^{(s)}}{2} \tag{3286a}$$

$$\frac{\sqrt{2}Y_{10,5}^{(c)}}{2} + \frac{\sqrt{2}iY_{10,5}^{(s)}}{2} \tag{3287a}$$

$$\frac{\sqrt{2}Y_{10,7}^{(c)}}{2} - \frac{\sqrt{2}iY_{10,7}^{(s)}}{2} \tag{3288a}$$

22.3.10 $E^{''2} : l = 11$

$$\frac{\sqrt{2}Y_{11,10}^{(c)}}{2} - \frac{\sqrt{2}iY_{11,10}^{(s)}}{2} \tag{3289a}$$

$$\frac{\sqrt{2}iY_{11,2}^{(c)}}{2} - \frac{\sqrt{2}Y_{11,2}^{(s)}}{2} \tag{3290a}$$

$$\frac{\sqrt{2}iY_{11,8}^{(c)}}{2} - \frac{\sqrt{2}Y_{11,8}^{(s)}}{2} \tag{3291a}$$

$$\frac{\sqrt{2}Y_{11,4}^{(c)}}{2} - \frac{\sqrt{2}iY_{11,4}^{(s)}}{2} \tag{3292a}$$

22.3.11 $E^{''2} : l = 12$

$$-\frac{\sqrt{2}iY_{12,7}^{(c)}}{2} - \frac{\sqrt{2}Y_{12,7}^{(s)}}{2} \tag{3293a}$$

$$\frac{\sqrt{2}Y_{12,5}^{(c)}}{2} + \frac{\sqrt{2}iY_{12,5}^{(s)}}{2} \tag{3294a}$$

$$-\frac{\sqrt{2}iY_{12,1}^{(c)}}{2} - \frac{\sqrt{2}Y_{12,1}^{(s)}}{2} \tag{3295a}$$

$$\frac{\sqrt{2}Y_{12,11}^{(c)}}{2} + \frac{\sqrt{2}iY_{12,11}^{(s)}}{2} \tag{3296a}$$

22.4 $E^{''1}$

22.4.1 $E^{''1} : l = 2$

$$\frac{\sqrt{2}iY_{2,1}^{(c)}}{2} - \frac{\sqrt{2}Y_{2,1}^{(s)}}{2} \tag{3297a}$$

22.4.2 $E^{''1} : l = 3$

$$\frac{\sqrt{2}Y_{3,2}^{(c)}}{2} - \frac{\sqrt{2}iY_{3,2}^{(s)}}{2} \tag{3298a}$$

22.4.3 $E^{''1} : l = 4$

$$\frac{\sqrt{2}Y_{4,1}^{(c)}}{2} + \frac{\sqrt{2}iY_{4,1}^{(s)}}{2} \tag{3299a}$$

22.4.4 $E^{''1} : l = 5$

$$-\frac{\sqrt{2}iY_{5,2}^{(c)}}{2} - \frac{\sqrt{2}Y_{5,2}^{(s)}}{2} \tag{3300a}$$

$$\frac{\sqrt{2}iY_{5,4}^{(c)}}{2} - \frac{\sqrt{2}Y_{5,4}^{(s)}}{2} \tag{3301a}$$

22.4.5 $E^{''1} : l = 6$

$$\frac{\sqrt{2}Y_{6,1}^{(c)}}{2} + \frac{\sqrt{2}iY_{6,1}^{(s)}}{2} \tag{3302a}$$

$$\frac{\sqrt{2}Y_{6,5}^{(c)}}{2} - \frac{\sqrt{2}iY_{6,5}^{(s)}}{2} \tag{3303a}$$

22.4.6 $E^{''1} : l = 7$

$$-\frac{\sqrt{2}iY_{7,2}^{(c)}}{2} - \frac{\sqrt{2}Y_{7,2}^{(s)}}{2} \tag{3304a}$$

$$\frac{\sqrt{2}Y_{7,4}^{(c)}}{2} + \frac{\sqrt{2}iY_{7,4}^{(s)}}{2} \tag{3305a}$$

22.4.7 $E^{''1} : l = 8$

$$\frac{\sqrt{2}Y_{8,7}^{(c)}}{2} + \frac{\sqrt{2}iY_{8,7}^{(s)}}{2} \tag{3306a}$$

$$-\frac{\sqrt{2}iY_{8,5}^{(c)}}{2} - \frac{\sqrt{2}Y_{8,5}^{(s)}}{2} \tag{3307a}$$

$$\frac{\sqrt{2}Y_{8,1}^{(c)}}{2} + \frac{\sqrt{2}iY_{8,1}^{(s)}}{2} \tag{3308a}$$

22.4.8 $E^{''1} : l = 9$

$$-\frac{\sqrt{2}iY_{9,8}^{(c)}}{2} - \frac{\sqrt{2}Y_{9,8}^{(s)}}{2} \tag{3309a}$$

$$-\frac{\sqrt{2}iY_{9,2}^{(c)}}{2} - \frac{\sqrt{2}Y_{9,2}^{(s)}}{2} \tag{3310a}$$

$$\frac{\sqrt{2}iY_{9,4}^{(c)}}{2} - \frac{\sqrt{2}Y_{9,4}^{(s)}}{2} \tag{3311a}$$

22.4.9 $E^{''1} : l = 10$

$$-\frac{\sqrt{2}iY_{10,5}^{(c)}}{2} - \frac{\sqrt{2}Y_{10,5}^{(s)}}{2} \tag{3312a}$$

$$\frac{\sqrt{2}Y_{10,1}^{(c)}}{2} + \frac{\sqrt{2}iY_{10,1}^{(s)}}{2} \tag{3313a}$$

$$\frac{\sqrt{2}Y_{10,7}^{(c)}}{2} + \frac{\sqrt{2}iY_{10,7}^{(s)}}{2} \tag{3314a}$$

22.4.10 $E^{''1} : l = 11$

$$\frac{\sqrt{2}iY_{11,4}^{(c)}}{2} - \frac{\sqrt{2}Y_{11,4}^{(s)}}{2} \tag{3315a}$$

$$\frac{\sqrt{2}Y_{11,10}^{(c)}}{2} + \frac{\sqrt{2}iY_{11,10}^{(s)}}{2} \tag{3316a}$$

$$\frac{\sqrt{2}Y_{11,2}^{(c)}}{2} - \frac{\sqrt{2}iY_{11,2}^{(s)}}{2} \tag{3317a}$$

$$-\frac{\sqrt{2}iY_{11,8}^{(c)}}{2} - \frac{\sqrt{2}Y_{11,8}^{(s)}}{2} \tag{3318a}$$

22.4.11 $E^{''1} : l = 12$

$$-\frac{\sqrt{2}iY_{12,11}^{(c)}}{2} - \frac{\sqrt{2}Y_{12,11}^{(s)}}{2} \tag{3319a}$$

$$\frac{\sqrt{2}iY_{12,1}^{(c)}}{2} - \frac{\sqrt{2}Y_{12,1}^{(s)}}{2} \tag{3320a}$$

$$\frac{\sqrt{2}iY_{12,7}^{(c)}}{2} - \frac{\sqrt{2}Y_{12,7}^{(s)}}{2} \tag{3321a}$$

$$-\frac{\sqrt{2}iY_{12,5}^{(c)}}{2} - \frac{\sqrt{2}Y_{12,5}^{(s)}}{2} \tag{3322a}$$

22.5 $E^{'2}$

22.5.1 $E^{'2} : l = 1$

$$\frac{\sqrt{2}iY_{1,1}^{(c)}}{2} - \frac{\sqrt{2}Y_{1,1}^{(s)}}{2} \tag{3323a}$$

22.5.2 $E^{'2} : l = 2$

$$-\frac{\sqrt{2}iY_{2,2}^{(c)}}{2} - \frac{\sqrt{2}Y_{2,2}^{(s)}}{2} \tag{3324a}$$

22.5.3 $E^{'2} : l = 3$

$$\frac{\sqrt{2}Y_{3,1}^{(c)}}{2} + \frac{\sqrt{2}iY_{3,1}^{(s)}}{2} \tag{3325a}$$

22.5.4 $E^{'2} : l = 4$

$$-\frac{\sqrt{2}iY_{4,2}^{(c)}}{2} - \frac{\sqrt{2}Y_{4,2}^{(s)}}{2} \tag{3326a}$$

$$\frac{\sqrt{2}iY_{4,4}^{(c)}}{2} - \frac{\sqrt{2}Y_{4,4}^{(s)}}{2} \tag{3327a}$$

22.5.5 $E^{'2} : l = 5$

$$-\frac{\sqrt{2}iY_{5,5}^{(c)}}{2} - \frac{\sqrt{2}Y_{5,5}^{(s)}}{2} \tag{3328a}$$

$$\frac{\sqrt{2}iY_{5,1}^{(c)}}{2} - \frac{\sqrt{2}Y_{5,1}^{(s)}}{2} \tag{3329a}$$

22.5.6 $E^{'2} : l = 6$

$$\frac{\sqrt{2}iY_{6,4}^{(c)}}{2} - \frac{\sqrt{2}Y_{6,4}^{(s)}}{2} \tag{3330a}$$

$$\frac{\sqrt{2}Y_{6,2}^{(c)}}{2} - \frac{\sqrt{2}iY_{6,2}^{(s)}}{2} \tag{3331a}$$

22.5.7 $E^{'2} : l = 7$

$$\frac{\sqrt{2}iY_{7,1}^{(c)}}{2} - \frac{\sqrt{2}Y_{7,1}^{(s)}}{2} \tag{3332a}$$

$$\frac{\sqrt{2}Y_{7,5}^{(c)}}{2} - \frac{\sqrt{2}iY_{7,5}^{(s)}}{2} \tag{3333a}$$

$$\frac{\sqrt{2}Y_{7,7}^{(c)}}{2} + \frac{\sqrt{2}iY_{7,7}^{(s)}}{2} \tag{3334a}$$

22.5.8 $E^{'2} : l = 8$

$$\frac{\sqrt{2}Y_{8,4}^{(c)}}{2} + \frac{\sqrt{2}iY_{8,4}^{(s)}}{2} \tag{3335a}$$

$$\frac{\sqrt{2}Y_{8,8}^{(c)}}{2} - \frac{\sqrt{2}iY_{8,8}^{(s)}}{2} \tag{3336a}$$

$$-\frac{\sqrt{2}iY_{8,2}^{(c)}}{2} - \frac{\sqrt{2}Y_{8,2}^{(s)}}{2} \tag{3337a}$$

22.5.9 $E^{'2} : l = 9$

$$\frac{\sqrt{2}Y_{9,7}^{(c)}}{2} + \frac{\sqrt{2}iY_{9,7}^{(s)}}{2} \tag{3338a}$$

$$\frac{\sqrt{2}Y_{9,5}^{(c)}}{2} - \frac{\sqrt{2}iY_{9,5}^{(s)}}{2} \tag{3339a}$$

$$\frac{\sqrt{2}iY_{9,1}^{(c)}}{2} - \frac{\sqrt{2}Y_{9,1}^{(s)}}{2} \tag{3340a}$$

22.5.10 $E^{'2} : l = 10$

$$\frac{\sqrt{2}Y_{10,8}^{(c)}}{2} - \frac{\sqrt{2}iY_{10,8}^{(s)}}{2} \tag{3341a}$$

$$\frac{\sqrt{2}Y_{10,2}^{(c)}}{2} - \frac{\sqrt{2}iY_{10,2}^{(s)}}{2} \tag{3342a}$$

$$\frac{\sqrt{2}iY_{10,4}^{(c)}}{2} - \frac{\sqrt{2}Y_{10,4}^{(s)}}{2} \tag{3343a}$$

$$\frac{\sqrt{2}iY_{10,10}^{(c)}}{2} - \frac{\sqrt{2}Y_{10,10}^{(s)}}{2} \tag{3344a}$$

22.5.11 $E^{'2} : l = 11$

$$\frac{\sqrt{2}Y_{11,1}^{(c)}}{2} + \frac{\sqrt{2}iY_{11,1}^{(s)}}{2} \tag{3345a}$$

$$-\frac{\sqrt{2}iY_{11,5}^{(c)}}{2} - \frac{\sqrt{2}Y_{11,5}^{(s)}}{2} \tag{3346a}$$

$$\frac{\sqrt{2}iY_{11,7}^{(c)}}{2} - \frac{\sqrt{2}Y_{11,7}^{(s)}}{2} \tag{3347a}$$

$$\frac{\sqrt{2}Y_{11,11}^{(c)}}{2} - \frac{\sqrt{2}iY_{11,11}^{(s)}}{2} \tag{3348a}$$

22.5.12 $E^{'2} : l = 12$

$$\frac{\sqrt{2}iY_{12,4}^{(c)}}{2} - \frac{\sqrt{2}Y_{12,4}^{(s)}}{2} \tag{3349a}$$

$$\frac{\sqrt{2}Y_{12,8}^{(c)}}{2} - \frac{\sqrt{2}iY_{12,8}^{(s)}}{2} \tag{3350a}$$

$$\frac{\sqrt{2}Y_{12,10}^{(c)}}{2} + \frac{\sqrt{2}iY_{12,10}^{(s)}}{2} \tag{3351a}$$

$$-\frac{\sqrt{2}iY_{12,2}^{(c)}}{2} - \frac{\sqrt{2}Y_{12,2}^{(s)}}{2} \tag{3352a}$$

22.6 $E^{'1}$

22.6.1 $E^{'1} : l = 1$

$$-\frac{\sqrt{2}iY_{1,1}^{(c)}}{2} - \frac{\sqrt{2}Y_{1,1}^{(s)}}{2} \tag{3353a}$$

22.6.2 $E^{'1} : l = 2$

$$\frac{\sqrt{2}Y_{2,2}^{(c)}}{2} + \frac{\sqrt{2}iY_{2,2}^{(s)}}{2} \tag{3354a}$$

22.6.3 $E^{'1} : l = 3$

$$\frac{\sqrt{2}Y_{3,1}^{(c)}}{2} - \frac{\sqrt{2}iY_{3,1}^{(s)}}{2} \tag{3355a}$$

22.6.4 $E^{'1} : l = 4$

$$\frac{\sqrt{2}Y_{4,2}^{(c)}}{2} + \frac{\sqrt{2}iY_{4,2}^{(s)}}{2} \tag{3356a}$$

$$\frac{\sqrt{2}Y_{4,4}^{(c)}}{2} - \frac{\sqrt{2}iY_{4,4}^{(s)}}{2} \tag{3357a}$$

22.6.5 $E^{'1} : l = 5$

$$\frac{\sqrt{2}Y_{5,5}^{(c)}}{2} + \frac{\sqrt{2}iY_{5,5}^{(s)}}{2} \tag{3358a}$$

$$-\frac{\sqrt{2}iY_{5,1}^{(c)}}{2} - \frac{\sqrt{2}Y_{5,1}^{(s)}}{2} \tag{3359a}$$

22.6.6 $E'^1 : l = 6$

$$\frac{\sqrt{2}Y_{6,2}^{(c)}}{2} + \frac{\sqrt{2}iY_{6,2}^{(s)}}{2}$$ (3360a)

$$\frac{\sqrt{2}Y_{6,4}^{(c)}}{2} - \frac{\sqrt{2}iY_{6,4}^{(s)}}{2}$$ (3361a)

22.6.7 $E'^1 : l = 7$

$$\frac{\sqrt{2}Y_{7,1}^{(c)}}{2} - \frac{\sqrt{2}iY_{7,1}^{(s)}}{2}$$ (3362a)

$$-\frac{\sqrt{2}iY_{7,7}^{(c)}}{2} - \frac{\sqrt{2}Y_{7,7}^{(s)}}{2}$$ (3363a)

$$\frac{\sqrt{2}Y_{7,5}^{(c)}}{2} + \frac{\sqrt{2}iY_{7,5}^{(s)}}{2}$$ (3364a)

22.6.8 $E'^1 : l = 8$

$$\frac{\sqrt{2}Y_{8,8}^{(c)}}{2} + \frac{\sqrt{2}iY_{8,8}^{(s)}}{2}$$ (3365a)

$$\frac{\sqrt{2}Y_{8,4}^{(c)}}{2} - \frac{\sqrt{2}iY_{8,4}^{(s)}}{2}$$ (3366a)

$$\frac{\sqrt{2}Y_{8,2}^{(c)}}{2} + \frac{\sqrt{2}iY_{8,2}^{(s)}}{2}$$ (3367a)

22.6.9 $E'^1 : l = 9$

$$\frac{\sqrt{2}Y_{9,1}^{(c)}}{2} - \frac{\sqrt{2}iY_{9,1}^{(s)}}{2}$$ (3368a)

$$\frac{\sqrt{2}iY_{9,5}^{(c)}}{2} - \frac{\sqrt{2}Y_{9,5}^{(s)}}{2}$$ (3369a)

$$\frac{\sqrt{2}Y_{9,7}^{(c)}}{2} - \frac{\sqrt{2}iY_{9,7}^{(s)}}{2}$$ (3370a)

22.6.10 $E'^1 : l = 10$

$$\frac{\sqrt{2}Y_{10,2}^{(c)}}{2} + \frac{\sqrt{2}iY_{10,2}^{(s)}}{2}$$ (3371a)

$$\frac{\sqrt{2}Y_{10,4}^{(c)}}{2} - \frac{\sqrt{2}iY_{10,4}^{(s)}}{2}$$ (3372a)

$$\frac{\sqrt{2}Y_{10,10}^{(c)}}{2} - \frac{\sqrt{2}iY_{10,10}^{(s)}}{2}$$ (3373a)

$$\frac{\sqrt{2}iY_{10,8}^{(c)}}{2} - \frac{\sqrt{2}Y_{10,8}^{(s)}}{2}$$ (3374a)

22.6.11 $E'^1 : l = 11$

$$\frac{\sqrt{2}Y_{11,5}^{(c)}}{2} + \frac{\sqrt{2}iY_{11,5}^{(s)}}{2}$$ (3375a)

$$-\frac{\sqrt{2}iY_{11,7}^{(c)}}{2} - \frac{\sqrt{2}Y_{11,7}^{(s)}}{2}$$ (3376a)

$$\frac{\sqrt{2}Y_{11,11}^{(c)}}{2} + \frac{\sqrt{2}iY_{11,11}^{(s)}}{2}$$ (3377a)

$$-\frac{\sqrt{2}iY_{11,1}^{(c)}}{2} - \frac{\sqrt{2}Y_{11,1}^{(s)}}{2}$$ (3378a)

22.6.12 $E'^1 : l = 12$

$$\frac{\sqrt{2}Y_{12,4}^{(c)}}{2} - \frac{\sqrt{2}iY_{12,4}^{(s)}}{2}$$ (3379a)

$$-\frac{\sqrt{2}iY_{12,10}^{(c)}}{2} - \frac{\sqrt{2}Y_{12,10}^{(s)}}{2}$$ (3380a)

$$\frac{\sqrt{2}iY_{12,8}^{(c)}}{2} - \frac{\sqrt{2}Y_{12,8}^{(s)}}{2}$$ (3381a)

$$\frac{\sqrt{2}Y_{12,2}^{(c)}}{2} + \frac{\sqrt{2}iY_{12,2}^{(s)}}{2}$$ (3382a)

23 Group C_{6h}

23.1 Γ^1

23.1.1 Γ^1 : $l = 0$

$$Y_{0,0}^{(c)} \tag{3383a}$$

23.1.2 Γ^1 : $l = 2$

$$Y_{2,0}^{(c)} \tag{3384a}$$

23.1.3 Γ^1 : $l = 4$

$$Y_{4,0}^{(c)} \tag{3385a}$$

23.1.4 Γ^1 : $l = 6$

$$-Y_{6,6}^{(s)} \tag{3386a}$$

$$Y_{6,6}^{(c)} \tag{3387a}$$

$$Y_{6,0}^{(c)} \tag{3388a}$$

23.1.5 Γ^1 : $l = 8$

$$Y_{8,6}^{(c)} \tag{3389a}$$

$$Y_{8,0}^{(c)} \tag{3390a}$$

$$-Y_{8,6}^{(s)} \tag{3391a}$$

23.1.6 Γ^1 : $l = 10$

$$Y_{10,6}^{(c)} \tag{3392a}$$

$$Y_{10,0}^{(c)} \tag{3393a}$$

$$-Y_{10,6}^{(s)} \tag{3394a}$$

23.1.7 Γ^1 : $l = 12$

$$Y_{12,6}^{(c)} \tag{3395a}$$

$$-Y_{12,12}^{(s)} \tag{3396a}$$

$$-Y_{12,6}^{(s)} \tag{3397a}$$

$$Y_{12,0}^{(c)} \tag{3398a}$$

$$Y_{12,12}^{(c)} \tag{3399a}$$

23.2 Γ^2

23.2.1 Γ^2 : $l = 3$

$$Y_{3,3}^{(c)} \tag{3400a}$$

$$-Y_{3,3}^{(s)} \tag{3401a}$$

23.2.2 Γ^2 : $l = 5$

$$-Y_{5,3}^{(s)} \tag{3402a}$$

$$Y_{5,3}^{(c)} \tag{3403a}$$

23.2.3 Γ^2 : $l = 7$

$$-Y_{7,3}^{(s)} \tag{3404a}$$

$$Y_{7,3}^{(c)} \tag{3405a}$$

23.2.4 Γ^2 : $l = 9$

$$-Y_{9,9}^{(s)} \tag{3406a}$$

$$Y_{9,9}^{(c)} \tag{3407a}$$

$$-Y_{9,3}^{(s)} \tag{3408a}$$

$$Y_{9,3}^{(c)} \tag{3409a}$$

23.2.5 Γ^2 : $l = 11$

$$Y_{11,3}^{(c)} \tag{3410a}$$

$$-Y_{11,9}^{(s)} \tag{3411a}$$

$$-Y_{11,3}^{(s)} \tag{3412a}$$

$$Y_{11,9}^{(c)} \tag{3413a}$$

23.3 Γ^3

23.3.1 Γ^3 : $l = 1$

$$\frac{\sqrt{2}iY_{1,1}^{(c)}}{2} - \frac{\sqrt{2}Y_{1,1}^{(s)}}{2} \tag{3414a}$$

23.3.2 Γ^3 : $l = 3$

$$\frac{\sqrt{2}Y_{3,1}^{(c)}}{2} + \frac{\sqrt{2}iY_{3,1}^{(s)}}{2} \tag{3415a}$$

23.3.3 Γ^3 : $l = 5$

$$\frac{\sqrt{2}iY_{5,1}^{(c)}}{2} - \frac{\sqrt{2}Y_{5,1}^{(s)}}{2} \tag{3416a}$$

$$\frac{\sqrt{2}Y_{5,5}^{(c)}}{2} - \frac{\sqrt{2}iY_{5,5}^{(s)}}{2} \tag{3417a}$$

23.3.4 Γ^3 : $l = 7$

$$\frac{\sqrt{2}Y_{7,1}^{(c)}}{2} + \frac{\sqrt{2}iY_{7,1}^{(s)}}{2} \tag{3418a}$$

$$\frac{\sqrt{2}iY_{7,7}^{(c)}}{2} - \frac{\sqrt{2}Y_{7,7}^{(s)}}{2} \tag{3419a}$$

$$-\frac{\sqrt{2}iY_{7,5}^{(c)}}{2} - \frac{\sqrt{2}Y_{7,5}^{(s)}}{2} \tag{3420a}$$

23.3.5 Γ^3 : $l = 9$

$$\frac{\sqrt{2}iY_{9,1}^{(c)}}{2} - \frac{\sqrt{2}Y_{9,1}^{(s)}}{2} \tag{3421a}$$

$$\frac{\sqrt{2}iY_{9,7}^{(c)}}{2} - \frac{\sqrt{2}Y_{9,7}^{(s)}}{2} \tag{3422a}$$

$$\frac{\sqrt{2}Y_{9,5}^{(c)}}{2} - \frac{\sqrt{2}iY_{9,5}^{(s)}}{2} \tag{3423a}$$

23.3.6 Γ^3 : $l = 11$

$$\frac{\sqrt{2}Y_{11,7}^{(c)}}{2} + \frac{\sqrt{2}iY_{11,7}^{(s)}}{2} \tag{3424a}$$

$$-\frac{\sqrt{2}iY_{11,5}^{(c)}}{2} - \frac{\sqrt{2}Y_{11,5}^{(s)}}{2} \tag{3425a}$$

$$\frac{\sqrt{2}Y_{11,1}^{(c)}}{2} + \frac{\sqrt{2}iY_{11,1}^{(s)}}{2} \tag{3426a}$$

$$-\frac{\sqrt{2}iY_{11,11}^{(c)}}{2} - \frac{\sqrt{2}Y_{11,11}^{(s)}}{2} \tag{3427a}$$

23.4 Γ^4

23.4.1 Γ^4 : $l = 1$

$$\frac{\sqrt{2}Y_{1,1}^{(c)}}{2} - \frac{\sqrt{2}iY_{1,1}^{(s)}}{2} \tag{3428a}$$

23.4.2 Γ^4 : $l = 3$

$$\frac{\sqrt{2}Y_{3,1}^{(c)}}{2} - \frac{\sqrt{2}iY_{3,1}^{(s)}}{2} \tag{3429a}$$

23.4.3 Γ^4 : $l = 5$

$$-\frac{\sqrt{2}iY_{5,1}^{(c)}}{2} - \frac{\sqrt{2}Y_{5,1}^{(s)}}{2} \tag{3430a}$$

$$\frac{\sqrt{2}iY_{5,5}^{(c)}}{2} - \frac{\sqrt{2}Y_{5,5}^{(s)}}{2} \tag{3431a}$$

23.4.4 Γ^4 : $l = 7$

$$-\frac{\sqrt{2}iY_{7,7}^{(c)}}{2} - \frac{\sqrt{2}Y_{7,7}^{(s)}}{2} \tag{3432a}$$

$$\frac{\sqrt{2}Y_{7,1}^{(c)}}{2} - \frac{\sqrt{2}iY_{7,1}^{(s)}}{2} \tag{3433a}$$

$$\frac{\sqrt{2}Y_{7,5}^{(c)}}{2} + \frac{\sqrt{2}iY_{7,5}^{(s)}}{2} \tag{3434a}$$

23.4.5 Γ^4 : $l = 9$

$$\frac{\sqrt{2}Y_{9,7}^{(c)}}{2} - \frac{\sqrt{2}iY_{9,7}^{(s)}}{2} \tag{3435a}$$

$$\frac{\sqrt{2}Y_{9,5}^{(c)}}{2} + \frac{\sqrt{2}iY_{9,5}^{(s)}}{2} \tag{3436a}$$

$$\frac{\sqrt{2}Y_{9,1}^{(s)}}{2} - \frac{\sqrt{2}iY_{9,1}^{(s)}}{2} \tag{3437a}$$

23.4.6 Γ^4 : $l = 11$

$$\frac{\sqrt{2}iY_{11,11}^{(c)}}{2} - \frac{\sqrt{2}Y_{11,11}^{(s)}}{2} \tag{3438a}$$

$$\frac{\sqrt{2}iY_{11,5}^{(c)}}{2} - \frac{\sqrt{2}Y_{11,5}^{(s)}}{2} \tag{3439a}$$

$$-\frac{\sqrt{2}iY_{11,1}^{(c)}}{2} - \frac{\sqrt{2}Y_{11,1}^{(s)}}{2} \tag{3440a}$$

$$\frac{\sqrt{2}Y_{11,7}^{(c)}}{2} - \frac{\sqrt{2}iY_{11,7}^{(s)}}{2} \tag{3441a}$$

23.5 Γ^5

23.5.1 Γ^5 : $l = 1$

$$Y_{1,0}^{(c)} \tag{3442a}$$

23.5.2 Γ^5 : $l = 3$

$$Y_{3,0}^{(c)} \tag{3443a}$$

23.5.3 Γ^5 : $l = 5$

$$Y_{5,0}^{(c)} \tag{3444a}$$

23.5.4 Γ^5 : $l = 7$

$$Y_{7,6}^{(c)} \tag{3445a}$$

$$Y_{7,0}^{(c)} \tag{3446a}$$

$$-Y_{7,6}^{(s)} \tag{3447a}$$

23.5.5 Γ^5 : $l = 9$

$$Y_{9,0}^{(c)} \tag{3448a}$$

$$Y_{9,6}^{(c)} \tag{3449a}$$

$$-Y_{9,6}^{(s)} \tag{3450a}$$

23.5.6 Γ^5 : $l = 11$

$$Y_{11,6}^{(c)} \tag{3451a}$$

$$-Y_{11,6}^{(s)} \tag{3452a}$$

$$Y_{11,0}^{(c)} \tag{3453a}$$

23.6 Γ^6

23.6.1 Γ^6 : $l = 3$

$$\frac{\sqrt{2}Y_{3,2}^{(c)}}{2} + \frac{\sqrt{2}iY_{3,2}^{(s)}}{2} \tag{3454a}$$

23.6.2 Γ^6 : $l = 5$

$$\frac{\sqrt{2}iY_{5,2}^{(c)}}{2} - \frac{\sqrt{2}Y_{5,2}^{(s)}}{2} \tag{3455a}$$

$$-\frac{\sqrt{2}iY_{5,4}^{(c)}}{2} - \frac{\sqrt{2}Y_{5,4}^{(s)}}{2} \tag{3456a}$$

23.6.3 $\Gamma^6 : l = 7$

$$\frac{\sqrt{2}Y_{7,4}^{(c)}}{2} - \frac{\sqrt{2}iY_{7,4}^{(s)}}{2} \tag{3457a}$$

$$\frac{\sqrt{2}iY_{7,2}^{(c)}}{2} - \frac{\sqrt{2}Y_{7,2}^{(s)}}{2} \tag{3458a}$$

23.6.4 $\Gamma^6 : l = 9$

$$\frac{\sqrt{2}iY_{9,8}^{(c)}}{2} - \frac{\sqrt{2}Y_{9,8}^{(s)}}{2} \tag{3459a}$$

$$-\frac{\sqrt{2}iY_{9,4}^{(c)}}{2} - \frac{\sqrt{2}Y_{9,4}^{(s)}}{2} \tag{3460a}$$

$$\frac{\sqrt{2}Y_{9,2}^{(c)}}{2} + \frac{\sqrt{2}iY_{9,2}^{(s)}}{2} \tag{3461a}$$

23.6.5 $\Gamma^6 : l = 11$

$$\frac{\sqrt{2}Y_{11,4}^{(c)}}{2} - \frac{\sqrt{2}iY_{11,4}^{(s)}}{2} \tag{3462a}$$

$$-\frac{\sqrt{2}iY_{11,10}^{(c)}}{2} - \frac{\sqrt{2}Y_{11,10}^{(s)}}{2} \tag{3463a}$$

$$\frac{\sqrt{2}iY_{11,8}^{(c)}}{2} - \frac{\sqrt{2}Y_{11,8}^{(s)}}{2} \tag{3464a}$$

$$\frac{\sqrt{2}Y_{11,2}^{(c)}}{2} + \frac{\sqrt{2}iY_{11,2}^{(s)}}{2} \tag{3465a}$$

23.7 Γ^7

23.7.1 $\Gamma^7 : l = 3$

$$-\frac{\sqrt{2}iY_{3,2}^{(c)}}{2} - \frac{\sqrt{2}Y_{3,2}^{(s)}}{2} \tag{3466a}$$

23.7.2 $\Gamma^7 : l = 5$

$$\frac{\sqrt{2}Y_{5,2}^{(c)}}{2} - \frac{\sqrt{2}iY_{5,2}^{(s)}}{2} \tag{3467a}$$

$$\frac{\sqrt{2}iY_{5,4}^{(c)}}{2} - \frac{\sqrt{2}Y_{5,4}^{(s)}}{2} \tag{3468a}$$

23.7.3 $\Gamma^7 : l = 7$

$$\frac{\sqrt{2}Y_{7,4}^{(c)}}{2} + \frac{\sqrt{2}iY_{7,4}^{(s)}}{2} \tag{3469a}$$

$$\frac{\sqrt{2}Y_{7,2}^{(c)}}{2} - \frac{\sqrt{2}iY_{7,2}^{(s)}}{2} \tag{3470a}$$

23.7.4 $\Gamma^7 : l = 9$

$$-\frac{\sqrt{2}iY_{9,2}^{(c)}}{2} - \frac{\sqrt{2}Y_{9,2}^{(s)}}{2} \tag{3471a}$$

$$\frac{\sqrt{2}iY_{9,4}^{(c)}}{2} - \frac{\sqrt{2}Y_{9,4}^{(s)}}{2} \tag{3472a}$$

$$-\frac{\sqrt{2}iY_{9,8}^{(c)}}{2} - \frac{\sqrt{2}Y_{9,8}^{(s)}}{2} \tag{3473a}$$

23.7.5 $\Gamma^7 : l = 11$

$$\frac{\sqrt{2}iY_{11,10}^{(c)}}{2} - \frac{\sqrt{2}Y_{11,10}^{(s)}}{2} \tag{3474a}$$

$$-\frac{\sqrt{2}iY_{11,2}^{(c)}}{2} - \frac{\sqrt{2}Y_{11,2}^{(s)}}{2} \tag{3475a}$$

$$\frac{\sqrt{2}iY_{11,4}^{(c)}}{2} - \frac{\sqrt{2}Y_{11,4}^{(s)}}{2} \tag{3476a}$$

$$-\frac{\sqrt{2}iY_{11,8}^{(c)}}{2} - \frac{\sqrt{2}Y_{11,8}^{(s)}}{2} \tag{3477a}$$

23.8 Γ^8

23.8.1 $\Gamma^8 : l = 4$

$$Y_{4,3}^{(c)} \tag{3478a}$$

$$-Y_{4,3}^{(s)} \tag{3479a}$$

23.8.2 $\Gamma^8 : l = 6$

$$-Y_{6,3}^{(s)} \tag{3480a}$$

$$Y_{6,3}^{(c)} \tag{3481a}$$

23.8.3 $\Gamma^8 : l = 8$

$$-Y_{8,3}^{(s)} \tag{3482a}$$

$$Y_{8,3}^{(c)} \tag{3483a}$$

23.8.4 $\Gamma^8 : l = 10$

$$-Y_{10,3}^{(s)} \tag{3484a}$$

$$Y_{10,9}^{(c)} \tag{3485a}$$

$$-Y_{10,9}^{(s)} \tag{3486a}$$

$$Y_{10,3}^{(c)} \tag{3487a}$$

23.8.5 $\Gamma^8 : l = 12$

$$-Y_{12,3}^{(s)} \tag{3488a}$$

$$-Y_{12,9}^{(s)} \tag{3489a}$$

$$Y_{12,9}^{(c)} \tag{3490a}$$

$$Y_{12,3}^{(c)} \tag{3491a}$$

23.9 Γ^9

23.9.1 $\Gamma^9 : l = 2$

$$\frac{\sqrt{2}Y_{2,1}^{(c)}}{2} - \frac{\sqrt{2}iY_{2,1}^{(s)}}{2} \tag{3492a}$$

23.9.2 $\Gamma^9 : l = 4$

$$\frac{\sqrt{2}Y_{4,1}^{(c)}}{2} - \frac{\sqrt{2}iY_{4,1}^{(s)}}{2} \tag{3493a}$$

23.9.3 $\Gamma^9 : l = 6$

$$\frac{\sqrt{2}Y_{6,5}^{(c)}}{2} + \frac{\sqrt{2}iY_{6,5}^{(s)}}{2} \tag{3494a}$$

$$\frac{\sqrt{2}Y_{6,1}^{(c)}}{2} - \frac{\sqrt{2}iY_{6,1}^{(s)}}{2} \tag{3495a}$$

23.9.4 $\Gamma^9 : l = 8$

$$-\frac{\sqrt{2}iY_{8,7}^{(c)}}{2} - \frac{\sqrt{2}Y_{8,7}^{(s)}}{2} \tag{3496a}$$

$$\frac{\sqrt{2}iY_{8,5}^{(c)}}{2} - \frac{\sqrt{2}Y_{8,5}^{(s)}}{2} \tag{3497a}$$

$$\frac{\sqrt{2}Y_{8,1}^{(c)}}{2} - \frac{\sqrt{2}iY_{8,1}^{(s)}}{2} \tag{3498a}$$

23.9.5 $\Gamma^9 : l = 10$

$$-\frac{\sqrt{2}iY_{10,7}^{(c)}}{2} - \frac{\sqrt{2}Y_{10,7}^{(s)}}{2} \tag{3499a}$$

$$-\frac{\sqrt{2}iY_{10,1}^{(c)}}{2} - \frac{\sqrt{2}Y_{10,1}^{(s)}}{2} \tag{3500a}$$

$$\frac{\sqrt{2}Y_{10,5}^{(c)}}{2} + \frac{\sqrt{2}iY_{10,5}^{(s)}}{2} \tag{3501a}$$

23.9.6 $\Gamma^9 : l = 12$

$$-\frac{\sqrt{2}iY_{12,7}^{(c)}}{2} - \frac{\sqrt{2}Y_{12,7}^{(s)}}{2} \tag{3502a}$$

$$\frac{\sqrt{2}iY_{12,5}^{(c)}}{2} - \frac{\sqrt{2}Y_{12,5}^{(s)}}{2} \tag{3503a}$$

$$\frac{\sqrt{2}Y_{12,11}^{(c)}}{2} + \frac{\sqrt{2}iY_{12,11}^{(s)}}{2} \tag{3504a}$$

$$-\frac{\sqrt{2}iY_{12,1}^{(c)}}{2} - \frac{\sqrt{2}Y_{12,1}^{(s)}}{2} \tag{3505a}$$

23.10 Γ^{10}

23.10.1 $\Gamma^{10} : l = 2$

$$\frac{\sqrt{2}Y_{2,1}^{(c)}}{2} + \frac{\sqrt{2}iY_{2,1}^{(s)}}{2} \tag{3506a}$$

23.10.2 $\Gamma^{10} : l = 4$

$$\frac{\sqrt{2}Y_{4,1}^{(c)}}{2} + \frac{\sqrt{2}iY_{4,1}^{(s)}}{2} \tag{3507a}$$

23.10.3 $\Gamma^{10} : l = 6$

$$\frac{\sqrt{2}Y_{6,1}^{(c)}}{2} + \frac{\sqrt{2}iY_{6,1}^{(s)}}{2} \tag{3508a}$$

$$-\frac{\sqrt{2}iY_{6,5}^{(c)}}{2} - \frac{\sqrt{2}Y_{6,5}^{(s)}}{2} \tag{3509a}$$

23.10.4 $\Gamma^{10} : l = 8$

$$\frac{\sqrt{2}Y_{8,5}^{(c)}}{2} - \frac{\sqrt{2}iY_{8,5}^{(s)}}{2} \tag{3510a}$$

$$\frac{\sqrt{2}iY_{8,1}^{(c)}}{2} - \frac{\sqrt{2}Y_{8,1}^{(s)}}{2} \tag{3511a}$$

$$\frac{\sqrt{2}iY_{8,7}^{(c)}}{2} - \frac{\sqrt{2}Y_{8,7}^{(s)}}{2} \tag{3512a}$$

23.10.5 $\Gamma^{10} : l = 10$

$$\frac{\sqrt{2}Y_{10,7}^{(c)}}{2} + \frac{\sqrt{2}iY_{10,7}^{(s)}}{2} \tag{3513a}$$

$$-\frac{\sqrt{2}iY_{10,5}^{(c)}}{2} - \frac{\sqrt{2}Y_{10,5}^{(s)}}{2} \tag{3514a}$$

$$\frac{\sqrt{2}iY_{10,1}^{(c)}}{2} - \frac{\sqrt{2}Y_{10,1}^{(s)}}{2} \tag{3515a}$$

23.10.6 $\Gamma^{10} : l = 12$

$$-\frac{\sqrt{2}iY_{12,11}^{(c)}}{2} - \frac{\sqrt{2}Y_{12,11}^{(s)}}{2} \tag{3516a}$$

$$\frac{\sqrt{2}iY_{12,7}^{(c)}}{2} - \frac{\sqrt{2}Y_{12,7}^{(s)}}{2} \tag{3517a}$$

$$\frac{\sqrt{2}Y_{12,5}^{(c)}}{2} - \frac{\sqrt{2}iY_{12,5}^{(s)}}{2} \tag{3518a}$$

$$\frac{\sqrt{2}iY_{12,1}^{(c)}}{2} - \frac{\sqrt{2}Y_{12,1}^{(s)}}{2} \tag{3519a}$$

23.11 Γ^{11}

23.11.1 $\Gamma^{11} : l = 2$

$$-\frac{\sqrt{2}iY_{2,2}^{(c)}}{2} - \frac{\sqrt{2}Y_{2,2}^{(s)}}{2} \tag{3520a}$$

23.11.2 $\Gamma^{11} : l = 4$

$$-\frac{\sqrt{2}iY_{4,2}^{(c)}}{2} - \frac{\sqrt{2}Y_{4,2}^{(s)}}{2} \tag{3521a}$$

$$\frac{\sqrt{2}iY_{4,4}^{(c)}}{2} - \frac{\sqrt{2}Y_{4,4}^{(s)}}{2} \tag{3522a}$$

23.11.3 $\Gamma^{11} : l = 6$

$$\frac{\sqrt{2}iY_{6,4}^{(c)}}{2} - \frac{\sqrt{2}Y_{6,4}^{(s)}}{2} \tag{3523a}$$

$$\frac{\sqrt{2}Y_{6,2}^{(c)}}{2} - \frac{\sqrt{2}iY_{6,2}^{(s)}}{2} \tag{3524a}$$

23.11.4 $\Gamma^{11} : l = 8$

$$\frac{\sqrt{2}Y_{8,2}^{(c)}}{2} - \frac{\sqrt{2}iY_{8,2}^{(s)}}{2} \tag{3525a}$$

$$\frac{\sqrt{2}iY_{8,4}^{(c)}}{2} - \frac{\sqrt{2}Y_{8,4}^{(s)}}{2} \tag{3526a}$$

$$-\frac{\sqrt{2}iY_{8,8}^{(c)}}{2} - \frac{\sqrt{2}Y_{8,8}^{(s)}}{2} \tag{3527a}$$

23.11.5 $\Gamma^{11} : l = 10$

$$\frac{\sqrt{2}Y_{10,10}^{(c)}}{2} + \frac{\sqrt{2}iY_{10,10}^{(s)}}{2} \tag{3528a}$$

$$\frac{\sqrt{2}Y_{10,4}^{(c)}}{2} + \frac{\sqrt{2}iY_{10,4}^{(s)}}{2} \tag{3529a}$$

$$-\frac{\sqrt{2}iY_{10,8}^{(c)}}{2} - \frac{\sqrt{2}Y_{10,8}^{(s)}}{2} \tag{3530a}$$

$$\frac{\sqrt{2}Y_{10,2}^{(c)}}{2} - \frac{\sqrt{2}iY_{10,2}^{(s)}}{2} \tag{3531a}$$

23.11.6 $\Gamma^{11} : l = 12$

$$\frac{\sqrt{2}iY_{12,10}^{(c)}}{2} - \frac{\sqrt{2}Y_{12,10}^{(s)}}{2} \tag{3532a}$$

$$\frac{\sqrt{2}Y_{12,8}^{(c)}}{2} - \frac{\sqrt{2}iY_{12,8}^{(s)}}{2} \tag{3533a}$$

$$-\frac{\sqrt{2}iY_{12,2}^{(c)}}{2} - \frac{\sqrt{2}Y_{12,2}^{(s)}}{2} \tag{3534a}$$

$$\frac{\sqrt{2}iY_{12,4}^{(c)}}{2} - \frac{\sqrt{2}Y_{12,4}^{(s)}}{2} \tag{3535a}$$

23.12 Γ^{12}

23.12.1 $\Gamma^{12} : l = 2$

$$\frac{\sqrt{2}Y_{2,2}^{(c)}}{2} + \frac{\sqrt{2}iY_{2,2}^{(s)}}{2} \tag{3536a}$$

23.12.2 $\Gamma^{12} : l = 4$

$$\frac{\sqrt{2}Y_{4,2}^{(c)}}{2} + \frac{\sqrt{2}iY_{4,2}^{(s)}}{2} \tag{3537a}$$

$$\frac{\sqrt{2}Y_{4,4}^{(c)}}{2} - \frac{\sqrt{2}iY_{4,4}^{(s)}}{2} \tag{3538a}$$

23.12.3 $\Gamma^{12} : l = 6$

$$\frac{\sqrt{2}Y_{6,2}^{(c)}}{2} + \frac{\sqrt{2}iY_{6,2}^{(s)}}{2} \tag{3539a}$$

$$\frac{\sqrt{2}Y_{6,4}^{(c)}}{2} - \frac{\sqrt{2}iY_{6,4}^{(s)}}{2} \tag{3540a}$$

23.12.4 $\Gamma^{12} : l = 8$

$$\frac{\sqrt{2}iY_{8,8}^{(c)}}{2} - \frac{\sqrt{2}Y_{8,8}^{(s)}}{2} \tag{3541a}$$

$$-\frac{\sqrt{2}iY_{8,4}^{(c)}}{2} - \frac{\sqrt{2}Y_{8,4}^{(s)}}{2} \tag{3542a}$$

$$\frac{\sqrt{2}Y_{8,2}^{(c)}}{2} + \frac{\sqrt{2}iY_{8,2}^{(s)}}{2} \tag{3543a}$$

23.12.5 $\Gamma^{12} : l = 10$

$$\frac{\sqrt{2}iY_{10,2}^{(c)}}{2} - \frac{\sqrt{2}Y_{10,2}^{(s)}}{2} \tag{3544a}$$

$$-\frac{\sqrt{2}iY_{10,4}^{(c)}}{2} - \frac{\sqrt{2}Y_{10,4}^{(s)}}{2} \tag{3545a}$$

$$\frac{\sqrt{2}Y_{10,8}^{(c)}}{2} + \frac{\sqrt{2}iY_{10,8}^{(s)}}{2} \tag{3546a}$$

$$-\frac{\sqrt{2}iY_{10,10}^{(c)}}{2} - \frac{\sqrt{2}Y_{10,10}^{(s)}}{2} \tag{3547a}$$

23.12.6 $\Gamma^{12} : l = 12$

$$\frac{\sqrt{2}Y_{12,10}^{(c)}}{2} - \frac{\sqrt{2}iY_{12,10}^{(s)}}{2} \tag{3548a}$$

$$\frac{\sqrt{2}iY_{12,2}^{(c)}}{2} - \frac{\sqrt{2}Y_{12,2}^{(s)}}{2} \tag{3549a}$$

$$\frac{\sqrt{2}iY_{12,8}^{(c)}}{2} - \frac{\sqrt{2}Y_{12,8}^{(s)}}{2} \tag{3550a}$$

$$\frac{\sqrt{2}Y_{12,4}^{(c)}}{2} - \frac{\sqrt{2}iY_{12,4}^{(s)}}{2} \tag{3551a}$$

24 Group D_6

24.1 A_1

24.1.1 $A_1 : l = 0$

$Y_{0,0}^{(c)}$ (3552a)

24.1.2 $A_1 : l = 2$

$Y_{2,0}^{(c)}$ (3553a)

24.1.3 $A_1 : l = 4$

$Y_{4,0}^{(c)}$ (3554a)

24.1.4 $A_1 : l = 6$

$Y_{6,6}^{(c)}$ (3555a)

$Y_{6,0}^{(c)}$ (3556a)

24.1.5 $A_1 : l = 7$

$-Y_{7,6}^{(s)}$ (3557a)

24.1.6 $A_1 : l = 8$

$Y_{8,6}^{(c)}$ (3558a)

$Y_{8,0}^{(c)}$ (3559a)

24.1.7 $A_1 : l = 9$

$-Y_{9,6}^{(s)}$ (3560a)

24.1.8 $A_1 : l = 10$

$Y_{10,6}^{(c)}$ (3561a)

$Y_{10,0}^{(c)}$ (3562a)

24.1.9 $A_1 : l = 11$

$-Y_{11,6}^{(s)}$ (3563a)

24.1.10 $A_1 : l = 12$

$Y_{12,12}^{(c)}$ (3564a)

$Y_{12,0}^{(c)}$ (3565a)

$Y_{12,6}^{(c)}$ (3566a)

24.2 B_1

24.2.1 $B_1 : l = 3$

$Y_{3,3}^{(c)}$ (3567a)

24.2.2 $B_1 : l = 4$

$-Y_{4,3}^{(s)}$ (3568a)

24.2.3 $B_1 : l = 5$

$Y_{5,3}^{(c)}$ (3569a)

24.2.4 $B_1 : l = 6$

$-Y_{6,3}^{(s)}$ (3570a)

24.2.5 $B_1 : l = 7$

$Y_{7,3}^{(c)}$ (3571a)

24.2.6 $B_1 : l = 8$

$-Y_{8,3}^{(s)}$ (3572a)

24.2.7 $B_1 : l = 9$

$Y_{9,9}^{(c)}$ (3573a)

$Y_{9,3}^{(c)}$ (3574a)

24.2.8 $B_1 : l = 10$

$-Y_{10,3}^{(s)}$ (3575a)

$-Y_{10,9}^{(s)}$ (3576a)

24.2.9 $B_1 : l = 11$

$Y_{11,3}^{(c)}$ (3577a)

$Y_{11,9}^{(c)}$ (3578a)

24.2.10 $B_1 : l = 12$

$-Y_{12,3}^{(s)}$ (3579a)

$-Y_{12,9}^{(s)}$ (3580a)

24.3 B_2

24.3.1 $B_2 : l = 3$

$-Y_{3,3}^{(s)}$ (3581a)

24.3.2 $B_2 : l = 4$

$Y_{4,3}^{(c)}$ (3582a)

24.3.3 $B_2 : l = 5$

$-Y_{5,3}^{(s)}$ (3583a)

24.3.4 $B_2 : l = 6$

$Y_{6,3}^{(c)}$ (3584a)

24.3.5 $B_2 : l = 7$

$-Y_{7,3}^{(s)}$ (3585a)

24.3.6 $B_2 : l = 8$

$Y_{8,3}^{(c)}$ (3586a)

24.3.7 $B_2 : l = 9$

$-Y_{9,9}^{(s)}$ (3587a)

$-Y_{9,3}^{(s)}$ (3588a)

24.3.8 $B_2 : l = 10$

$Y_{10,9}^{(c)}$ (3589a)

$Y_{10,3}^{(c)}$ (3590a)

24.3.9 $B_2 : l = 11$

$-Y_{11,9}^{(s)}$ (3591a)

$-Y_{11,3}^{(s)}$ (3592a)

24.3.10 $B_2 : l = 12$

$Y_{12,9}^{(c)}$ (3593a)

$Y_{12,3}^{(c)}$ (3594a)

24.4 A_2

24.4.1 $A_2 : l = 1$

$Y_{1,0}^{(c)}$ (3595a)

24.4.2 $A_2 : l = 3$

$Y_{3,0}^{(c)}$ (3596a)

24.4.3 $A_2 : l = 5$

$Y_{5,0}^{(c)}$ (3597a)

24.4.4 $A_2 : l = 6$

$-Y_{6,6}^{(s)}$ (3598a)

24.4.5 $A_2 : l = 7$

$Y_{7,6}^{(c)}$ (3599a)

$Y_{7,0}^{(c)}$ (3600a)

24.4.6 $A_2 : l = 8$

$-Y_{8,6}^{(s)}$ (3601a)

24.4.7 $A_2 : l = 9$

$Y_{9,0}^{(c)}$ (3602a)

$Y_{9,6}^{(c)}$ (3603a)

24.4.8 $A_2 : l = 10$

$-Y_{10,6}^{(s)}$ (3604a)

24.4.9 $A_2 : l = 11$

$Y_{11,6}^{(c)}$ (3605a)

$Y_{11,0}^{(c)}$ (3606a)

24.4.10 $A_2 : l = 12$

$-Y_{12,12}^{(s)}$ (3607a)

$-Y_{12,6}^{(s)}$ (3608a)

24.5 E_2

24.5.1 $E_2 : l = 2$

$-Y_{2,2}^{(s)}$ (3609a)

$Y_{2,2}^{(c)}$ (3609b)

24.5.2 $E_2 : l = 3$

$-Y_{3,2}^{(c)}$ (3610a)

$-Y_{3,2}^{(s)}$ (3610b)

24.5.3 $E_2 : l = 4$

$Y_{4,4}^{(s)}$ (3611a)

$Y_{4,4}^{(c)}$ (3611b)

$-Y_{4,2}^{(s)}$ (3612a)

$Y_{4,2}^{(c)}$ (3612b)

24.5.4 $E_2 : l = 5$

$Y_{5,2}^{(c)}$ (3613a)

$Y_{5,2}^{(s)}$ (3613b)

$Y_{5,4}^{(c)}$ (3614a)

$-Y_{5,4}^{(s)}$ (3614b)

24.5.5 $E_2 : l = 6$

$Y_{6,4}^{(s)}$ (3615a)

$Y_{6,4}^{(c)}$ (3615b)

$-Y_{6,2}^{(s)}$ (3616a)

$Y_{6,2}^{(c)}$ (3616b)

24.5.6 $E_2 : l = 7$

$Y_{7,4}^{(c)}$ (3617a)

$-Y_{7,4}^{(s)}$ (3617b)

$Y_{7,2}^{(c)}$ (3618a)

$Y_{7,2}^{(s)}$ (3618b)

24.5.7 $E_2 : l = 8$

$Y_{8,4}^{(s)}$ (3619a)

$Y_{8,4}^{(c)}$ (3619b)

$-Y_{8,2}^{(s)}$ (3620a)

$Y_{8,2}^{(c)}$ (3620b)

$-Y_{8,8}^{(s)}$ (3621a)

$Y_{8,8}^{(c)}$ (3621b)

24.5.8 $E_2 : l = 9$

$Y_{9,4}^{(c)}$ (3622a)

$-Y_{9,4}^{(s)}$ (3622b)

$Y_{9,2}^{(c)}$ (3623a)

$Y_{9,2}^{(s)}$ (3623b)

$-Y_{9,8}^{(c)}$ (3624a)

$-Y_{9,8}^{(s)}$ (3624b)

24.5.9 $E_2 : l = 10$

$-Y_{10,8}^{(s)}$ (3625a)

$Y_{10,8}^{(c)}$ (3625b)

$Y_{10,4}^{(s)}$ (3626a)

$Y_{10,4}^{(c)}$ (3626b)

$-Y_{10,2}^{(s)}$ (3627a)

$Y_{10,2}^{(c)}$ (3627b)

$Y_{10,10}^{(s)}$ (3628a)

$Y_{10,10}^{(c)}$ (3628b)

24.5.10 $E_2 : l = 11$

$Y_{11,10}^{(c)}$ (3629a)

$-Y_{11,10}^{(s)}$ (3629b)

$-Y_{11,8}^{(c)}$ (3630a)

$-Y_{11,8}^{(s)}$ (3630b)

$Y_{11,4}^{(c)}$ (3631a)

$-Y_{11,4}^{(s)}$ (3631b)

$Y_{11,2}^{(c)}$ (3632a)

$Y_{11,2}^{(s)}$ (3632b)

24.5.11 $E_2 : l = 12$

$Y_{12,4}^{(s)}$ (3633a)

$Y_{12,4}^{(c)}$ (3633b)

$-Y_{12,10}^{(s)}$ (3634a)

$-Y_{12,10}^{(c)}$ (3634b)

$-Y_{12,2}^{(s)}$ (3635a)

$Y_{12,2}^{(c)}$ (3635b)

$-Y_{12,8}^{(s)}$ (3636a)

$Y_{12,8}^{(c)}$ (3636b)

24.6 E_1

24.6.1 $E_1 : l = 1$

$-Y_{1,1}^{(s)}$ (3637a)

$Y_{1,1}^{(c)}$ (3637b)

24.6.2 $E_1 : l = 2$

$-Y_{2,1}^{(c)}$ (3638a)

$-Y_{2,1}^{(s)}$ (3638b)

24.6.3 $E_1 : l = 3$

$-Y_{3,1}^{(s)}$ (3639a)

$Y_{3,1}^{(c)}$ (3639b)

24.6.4 $E_1 : l = 4$

$Y_{4,1}^{(c)}$ (3640a)

$Y_{4,1}^{(s)}$ (3640b)

24.6.5 $E_1 : l = 5$

$-Y_{5,1}^{(s)}$ (3641a)

$Y_{5,1}^{(c)}$ (3641b)

$Y_{5,5}^{(s)}$ (3642a)

$Y_{5,5}^{(c)}$ (3642b)

24.6.6 $E_1 : l = 6$

$-Y_{6,1}^{(c)}$ (3643a)

$-Y_{6,1}^{(s)}$ (3643b)

$Y_{6,5}^{(c)}$ (3644a)

$-Y_{6,5}^{(s)}$ (3644b)

24.6.7 $E_1 : l = 7$

$-Y_{7,5}^{(s)}$ (3645a)

$-Y_{7,5}^{(c)}$ (3645b)

$-Y_{7,7}^{(s)}$ (3646a)

$Y_{7,7}^{(c)}$ (3646b)

$-Y_{7,1}^{(s)}$ (3647a)

$Y_{7,1}^{(c)}$ (3647b)

24.6.8 $E_1 : l = 8$

$Y_{8,7}^{(c)}$ (3648a)

$Y_{8,7}^{(s)}$ (3648b)

$Y_{8,5}^{(c)}$ (3649a)

$-Y_{8,5}^{(s)}$ (3649b)

$-Y_{8,1}^{(c)}$ (3650a)

$-Y_{8,1}^{(s)}$ (3650b)

24.6.9 $E_1 : l = 9$

$Y_{9,5}^{(s)}$ (3651a)

$Y_{9,5}^{(c)}$ (3651b)

$-Y_{9,7}^{(s)}$ (3652a)

$Y_{9,7}^{(c)}$ (3652b)

$-Y_{9,1}^{(s)}$ (3653a)

$Y_{9,1}^{(c)}$ (3653b)

24.6.10 $E_1 : l = 10$

$Y_{10,5}^{(c)}$ (3654a)

$-Y_{10,5}^{(s)}$ (3654b)

$-Y_{10,1}^{(c)}$ (3655a)

$-Y_{10,1}^{(s)}$ (3655b)

$-Y_{10,7}^{(c)}$ (3656a)

$-Y_{10,7}^{(s)}$ (3656b)

24.6.11 $E_1 : l = 11$

$-Y_{11,5}^{(s)}$ (3657a)

$-Y_{11,5}^{(c)}$ (3657b)

$-Y_{11,1}^{(s)}$ (3658a)

$Y_{11,1}^{(c)}$ (3658b)

$-Y_{11,7}^{(s)}$ (3659a)

$Y_{11,7}^{(c)}$ (3659b)

$-Y_{11,11}^{(s)}$ (3660a)

$-Y_{11,11}^{(c)}$ (3660b)

24.6.12 $E_1 : l = 12$

$-Y_{12,1}^{(c)}$ (3661a)

$-Y_{12,1}^{(s)}$ (3661b)

$Y_{12,11}^{(c)}$ (3662a)

$-Y_{12,11}^{(s)}$ (3662b)

$Y_{12,5}^{(c)}$ (3663a)

$-Y_{12,5}^{(s)}$ (3663b)

$-Y_{12,7}^{(c)}$ (3664a)

$-Y_{12,7}^{(s)}$ (3664b)

25   Group C_{6v}

25.1 A_1

25.1.1 $A_1 : l = 0$

$$Y_{0,0}^{(c)} \tag{3665a}$$

25.1.2 $A_1 : l = 1$

$$Y_{1,0}^{(c)} \tag{3666a}$$

25.1.3 $A_1 : l = 2$

$$Y_{2,0}^{(c)} \tag{3667a}$$

25.1.4 $A_1 : l = 3$

$$Y_{3,0}^{(c)} \tag{3668a}$$

25.1.5 $A_1 : l = 4$

$$Y_{4,0}^{(c)} \tag{3669a}$$

25.1.6 $A_1 : l = 5$

$$Y_{5,0}^{(c)} \tag{3670a}$$

25.1.7 $A_1 : l = 6$

$$Y_{6,6}^{(c)} \tag{3671a}$$

$$Y_{6,0}^{(c)} \tag{3672a}$$

25.1.8 $A_1 : l = 7$

$$Y_{7,6}^{(c)} \tag{3673a}$$

$$Y_{7,0}^{(c)} \tag{3674a}$$

25.1.9 $A_1 : l = 8$

$$Y_{8,6}^{(c)} \tag{3675a}$$

$$Y_{8,0}^{(c)} \tag{3676a}$$

25.1.10 $A_1 : l = 9$

$$Y_{9,0}^{(c)} \tag{3677a}$$

$$Y_{9,6}^{(c)} \tag{3678a}$$

25.1.11 $A_1 : l = 10$

$$Y_{10,6}^{(c)} \tag{3679a}$$

$$Y_{10,0}^{(c)} \tag{3680a}$$

25.1.12 $A_1 : l = 11$

$$Y_{11,6}^{(c)} \tag{3681a}$$

$$Y_{11,0}^{(c)} \tag{3682a}$$

25.1.13 $A_1 : l = 12$

$$Y_{12,12}^{(c)} \tag{3683a}$$

$$Y_{12,0}^{(c)} \tag{3684a}$$

$$Y_{12,6}^{(c)} \tag{3685a}$$

25.2 B_2

25.2.1 $B_2 : l = 3$

$$Y_{3,3}^{(c)} \tag{3686a}$$

25.2.2 $B_2 : l = 4$

$$Y_{4,3}^{(c)} \tag{3687a}$$

25.2.3 $B_2 : l = 5$

$$Y_{5,3}^{(c)} \tag{3688a}$$

25.2.4 $B_2 : l = 6$

$$Y_{6,3}^{(c)} \tag{3689a}$$

25.2.5 $B_2 : l = 7$

$$Y_{7,3}^{(c)} \tag{3690a}$$

25.2.6 $B_2 : l = 8$

$$Y_{8,3}^{(c)} \tag{3691a}$$

25.2.7 $B_2 : l = 9$

$$Y_{9,9}^{(c)} \tag{3692a}$$

$$Y_{9,3}^{(c)} \tag{3693a}$$

25.2.8 $B_2 : l = 10$

$$Y_{10,9}^{(c)} \tag{3694a}$$

$$Y_{10,3}^{(c)} \tag{3695a}$$

25.2.9 $B_2 : l = 11$

$$Y_{11,3}^{(c)} \tag{3696a}$$

$$Y_{11,9}^{(c)} \tag{3697a}$$

25.2.10 $B_2 : l = 12$

$$Y_{12,9}^{(c)} \tag{3698a}$$

$$Y_{12,3}^{(c)} \tag{3699a}$$

25.3 B_1

25.3.1 $B_1 : l = 3$

$$-Y_{3,3}^{(s)} \tag{3700a}$$

25.3.2 $B_1 : l = 4$

$$-Y_{4,3}^{(s)} \tag{3701a}$$

25.3.3 $B_1 : l = 5$

$$-Y_{5,3}^{(s)} \tag{3702a}$$

25.3.4 $B_1 : l = 6$

$$-Y_{6,3}^{(s)} \tag{3703a}$$

25.3.5 $B_1 : l = 7$

$$-Y_{7,3}^{(s)} \tag{3704a}$$

25.3.6 $B_1 : l = 8$

$$-Y_{8,3}^{(s)} \tag{3705a}$$

25.3.7 $B_1 : l = 9$

$$-Y_{9,9}^{(s)} \tag{3706a}$$

$$-Y_{9,3}^{(s)} \tag{3707a}$$

25.3.8 $B_1 : l = 10$

$$-Y_{10,3}^{(s)} \tag{3708a}$$

$$-Y_{10,9}^{(s)} \tag{3709a}$$

25.3.9 $B_1 : l = 11$

$$-Y_{11,9}^{(s)} \tag{3710a}$$

$$-Y_{11,3}^{(s)} \tag{3711a}$$

25.3.10 $B_1 : l = 12$

$$-Y_{12,3}^{(s)} \tag{3712a}$$

$$-Y_{12,9}^{(s)} \tag{3713a}$$

25.4 A_2

25.4.1 $A_2 : l = 6$

$$-Y_{6,6}^{(s)} \tag{3714a}$$

25.4.2 $A_2 : l = 7$

$$-Y_{7,6}^{(s)} \tag{3715a}$$

25.4.3 $A_2 : l = 8$

$$-Y_{8,6}^{(s)} \tag{3716a}$$

25.4.4 $A_2 : l = 9$

$$-Y_{9,6}^{(s)} \tag{3717a}$$

25.4.5 $A_2 : l = 10$

$$-Y_{10,6}^{(s)} \tag{3718a}$$

25.4.6 $A_2 : l = 11$

$$-Y_{11,6}^{(s)} \tag{3719a}$$

25.4.7 $A_2 : l = 12$

$$-Y_{12,12}^{(s)} \tag{3720a}$$

$$-Y_{12,6}^{(s)} \tag{3721a}$$

25.5 E_2

25.5.1 $E_2 : l = 2$

$$-Y_{2,2}^{(s)} \tag{3722a}$$

$$Y_{2,2}^{(c)} \tag{3722b}$$

25.5.2 $E_2 : l = 3$

$$-Y_{3,2}^{(s)} \tag{3723a}$$

$$Y_{3,2}^{(c)} \tag{3723b}$$

25.5.3 $E_2 : l = 4$

$$Y_{4,4}^{(s)} \tag{3724a}$$

$$Y_{4,4}^{(c)} \tag{3724b}$$

$$-Y_{4,2}^{(s)} \tag{3725a}$$

$$Y_{4,2}^{(c)} \tag{3725b}$$

25.5.4 $E_2 : l = 5$

$$-Y_{5,2}^{(s)} \tag{3726a}$$

$$Y_{5,2}^{(c)} \tag{3726b}$$

$$-Y_{5,4}^{(s)} \tag{3727a}$$

$$-Y_{5,4}^{(c)} \tag{3727b}$$

25.5.5 $E_2 : l = 6$

$Y_{6,4}^{(s)}$	(3728a)
$Y_{6,4}^{(c)}$	(3728b)

$-Y_{6,2}^{(s)}$	(3729a)
$Y_{6,2}^{(c)}$	(3729b)

25.5.6 $E_2 : l = 7$

$-Y_{7,2}^{(s)}$	(3730a)
$Y_{7,2}^{(c)}$	(3730b)

$Y_{7,4}^{(s)}$	(3731a)
$Y_{7,4}^{(c)}$	(3731b)

25.5.7 $E_2 : l = 8$

$Y_{8,4}^{(s)}$	(3732a)
$Y_{8,4}^{(c)}$	(3732b)

$-Y_{8,2}^{(s)}$	(3733a)
$Y_{8,2}^{(c)}$	(3733b)

$-Y_{8,8}^{(s)}$	(3734a)
$Y_{8,8}^{(c)}$	(3734b)

25.5.8 $E_2 : l = 9$

$-Y_{9,8}^{(s)}$	(3735a)
$Y_{9,8}^{(c)}$	(3735b)

$Y_{9,4}^{(s)}$	(3736a)
$Y_{9,4}^{(c)}$	(3736b)

$-Y_{9,2}^{(s)}$	(3737a)
$Y_{9,2}^{(c)}$	(3737b)

25.5.9 $E_2 : l = 10$

$-Y_{10,8}^{(s)}$	(3738a)
$Y_{10,8}^{(c)}$	(3738b)

$Y_{10,4}^{(s)}$	(3739a)
$Y_{10,4}^{(c)}$	(3739b)

$-Y_{10,2}^{(s)}$	(3740a)
$Y_{10,2}^{(c)}$	(3740b)

$Y_{10,10}^{(s)}$	(3741a)
$Y_{10,10}^{(c)}$	(3741b)

25.5.10 $E_2 : l = 11$

$-Y_{11,4}^{(s)}$	(3742a)
$-Y_{11,4}^{(c)}$	(3742b)

$-Y_{11,8}^{(s)}$	(3743a)
$Y_{11,8}^{(c)}$	(3743b)

$-Y_{11,10}^{(s)}$	(3744a)
$-Y_{11,10}^{(c)}$	(3744b)

$-Y_{11,2}^{(s)}$	(3745a)
$Y_{11,2}^{(c)}$	(3745b)

25.5.11 $E_2 : l = 12$

$Y_{12,4}^{(s)}$	(3746a)
$Y_{12,4}^{(c)}$	(3746b)

$-Y_{12,10}^{(s)}$	(3747a)
$-Y_{12,10}^{(c)}$	(3747b)

$-Y_{12,2}^{(s)}$	(3748a)
$Y_{12,2}^{(c)}$	(3748b)

$-Y_{12,8}^{(s)}$	(3749a)
$Y_{12,8}^{(c)}$	(3749b)

25.6 E_1

25.6.1 $E_1 : l = 1$

$-Y_{1,1}^{(s)}$	(3750a)
$Y_{1,1}^{(c)}$	(3750b)

25.6.2 $E_1 : l = 2$

$-Y_{2,1}^{(s)}$	(3751a)
$Y_{2,1}^{(c)}$	(3751b)

25.6.3 $E_1 : l = 3$

$-Y_{3,1}^{(s)}$	(3752a)
$Y_{3,1}^{(c)}$	(3752b)

25.6.4 $E_1 : l = 4$

$-Y_{4,1}^{(s)}$	(3753a)
$Y_{4,1}^{(c)}$	(3753b)

25.6.5 $E_1 : l = 5$

$-Y_{5,1}^{(s)}$	(3754a)
$Y_{5,1}^{(c)}$	(3754b)

$Y_{5,5}^{(s)}$	(3755a)
$Y_{5,5}^{(c)}$	(3755b)

25.6.6 $E_1 : l = 6$

$-Y_{6,1}^{(s)}$	(3756a)
$Y_{6,1}^{(c)}$	(3756b)

$Y_{6,5}^{(s)}$	(3757a)
$Y_{6,5}^{(c)}$	(3757b)

25.6.7 $E_1 : l = 7$

$-Y_{7,5}^{(s)}$	(3758a)
$-Y_{7,5}^{(c)}$	(3758b)

$-Y_{7,7}^{(s)}$	(3759a)
$Y_{7,7}^{(c)}$	(3759b)

$-Y_{7,1}^{(s)}$	(3760a)
$Y_{7,1}^{(c)}$	(3760b)

25.6.8 $E_1 : l = 8$

$-Y_{8,7}^{(s)}$	(3761a)
$Y_{8,7}^{(c)}$	(3761b)

$Y_{8,5}^{(s)}$	(3762a)
$Y_{8,5}^{(c)}$	(3762b)

$-Y_{8,1}^{(s)}$	(3763a)
$Y_{8,1}^{(c)}$	(3763b)

25.6.9 $E_1 : l = 9$

$Y_{9,5}^{(s)}$	(3764a)
$Y_{9,5}^{(c)}$	(3764b)

$-Y_{9,7}^{(s)}$	(3765a)
$Y_{9,7}^{(c)}$	(3765b)

$-Y_{9,1}^{(s)}$	(3766a)
$Y_{9,1}^{(c)}$	(3766b)

25.6.10 $E_1 : l = 10$

$-Y_{10,7}^{(s)}$	(3767a)
$Y_{10,7}^{(c)}$	(3767b)

$Y_{10,5}^{(s)}$	(3768a)
$Y_{10,5}^{(c)}$	(3768b)

$-Y_{10,1}^{(s)}$	(3769a)
$Y_{10,1}^{(c)}$	(3769b)

25.6.11 $E_1 : l = 11$

$-Y_{11,5}^{(s)}$	(3770a)
$-Y_{11,5}^{(c)}$	(3770b)

$-Y_{11,1}^{(s)}$	(3771a)
$Y_{11,1}^{(c)}$	(3771b)

$-Y_{11,7}^{(s)}$	(3772a)
$Y_{11,7}^{(c)}$	(3772b)

$-Y_{11,11}^{(s)}$	(3773a)
$-Y_{11,11}^{(c)}$	(3773b)

25.6.12 $E_1 : l = 12$

$-Y_{12,7}^{(s)}$	(3774a)
$Y_{12,7}^{(c)}$	(3774b)

$-Y_{12,11}^{(s)}$	(3775a)
$-Y_{12,11}^{(c)}$	(3775b)

$-Y_{12,1}^{(s)}$	(3776a)
$Y_{12,1}^{(c)}$	(3776b)

$Y_{12,5}^{(s)}$	(3777a)
$Y_{12,5}^{(c)}$	(3777b)

26   Group D_{3h}

26.1 A_1'

26.1.1 $A_1' : l = 0$

$$Y_{0,0}^{(c)} \tag{3778a}$$

26.1.2 $A_1' : l = 2$

$$Y_{2,0}^{(c)} \tag{3779a}$$

26.1.3 $A_1' : l = 3$

$$Y_{3,3}^{(c)} \tag{3780a}$$

26.1.4 $A_1' : l = 4$

$$Y_{4,0}^{(c)} \tag{3781a}$$

26.1.5 $A_1' : l = 5$

$$Y_{5,3}^{(c)} \tag{3782a}$$

26.1.6 $A_1' : l = 6$

$$Y_{6,6}^{(c)} \tag{3783a}$$

$$Y_{6,0}^{(c)} \tag{3784a}$$

26.1.7 $A_1' : l = 7$

$$Y_{7,3}^{(c)} \tag{3785a}$$

26.1.8 $A_1' : l = 8$

$$Y_{8,6}^{(c)} \tag{3786a}$$

$$Y_{8,0}^{(c)} \tag{3787a}$$

26.1.9 $A_1' : l = 9$

$$Y_{9,9}^{(c)} \tag{3788a}$$

$$Y_{9,3}^{(c)} \tag{3789a}$$

26.1.10 $A_1' : l = 10$

$$Y_{10,6}^{(c)} \tag{3790a}$$

$$Y_{10,0}^{(c)} \tag{3791a}$$

26.1.11 $A_1' : l = 11$

$$Y_{11,3}^{(c)} \tag{3792a}$$

$$Y_{11,9}^{(c)} \tag{3793a}$$

26.1.12 $A_1' : l = 12$

$$Y_{12,12}^{(c)} \tag{3794a}$$

$$Y_{12,0}^{(c)} \tag{3795a}$$

$$Y_{12,6}^{(c)} \tag{3796a}$$

26.2 A_2''

26.2.1 $A_2'' : l = 1$

$$Y_{1,0}^{(c)} \tag{3797a}$$

26.2.2 $A_2'' : l = 3$

$$Y_{3,0}^{(c)} \tag{3798a}$$

26.2.3 $A_2'' : l = 4$

$$Y_{4,3}^{(c)} \tag{3799a}$$

26.2.4 $A_2'' : l = 5$

$$Y_{5,0}^{(c)} \tag{3800a}$$

26.2.5 $A_2'' : l = 6$

$$Y_{6,3}^{(c)} \tag{3801a}$$

26.2.6 $A_2'' : l = 7$

$$Y_{7,6}^{(c)} \tag{3802a}$$

$$Y_{7,0}^{(c)} \tag{3803a}$$

26.2.7 $A_2'' : l = 8$

$$Y_{8,3}^{(c)} \tag{3804a}$$

26.2.8 $A_2'' : l = 9$

$$Y_{9,0}^{(c)} \tag{3805a}$$

$$Y_{9,6}^{(c)} \tag{3806a}$$

26.2.9 $A_2'' : l = 10$

$$Y_{10,9}^{(c)} \tag{3807a}$$

$$Y_{10,3}^{(c)} \tag{3808a}$$

26.2.10 $A_2'' : l = 11$

$$Y_{11,6}^{(c)} \tag{3809a}$$

$$Y_{11,0}^{(c)} \tag{3810a}$$

26.2.11 $A_2'' : l = 12$

$$Y_{12,9}^{(c)} \tag{3811a}$$

$$Y_{12,3}^{(c)} \tag{3812a}$$

26.3 A_1''

26.3.1 $A_1'' : l = 4$

$$-Y_{4,3}^{(s)} \tag{3813a}$$

26.3.2 $A_1'' : l = 6$

$$-Y_{6,3}^{(s)} \tag{3814a}$$

26.3.3 $A_1'' : l = 7$

$$-Y_{7,6}^{(s)} \tag{3815a}$$

26.3.4 $A_1'' : l = 8$

$$-Y_{8,3}^{(s)} \tag{3816a}$$

26.3.5 $A_1'' : l = 9$

$$-Y_{9,6}^{(s)} \tag{3817a}$$

26.3.6 $A_1'' : l = 10$

$$-Y_{10,3}^{(s)} \tag{3818a}$$

$$-Y_{10,9}^{(s)} \tag{3819a}$$

26.3.7 $A_1'' : l = 11$

$$-Y_{11,6}^{(s)} \tag{3820a}$$

26.3.8 $A_1'' : l = 12$

$$-Y_{12,3}^{(s)} \tag{3821a}$$

$$-Y_{12,9}^{(s)} \tag{3822a}$$

26.4 A_2'

26.4.1 $A_2' : l = 3$

$$-Y_{3,3}^{(s)} \tag{3823a}$$

26.4.2 $A_2' : l = 5$

$$-Y_{5,3}^{(s)} \tag{3824a}$$

26.4.3 $A_2' : l = 6$

$$-Y_{6,6}^{(s)} \tag{3825a}$$

26.4.4 $A_2' : l = 7$

$$-Y_{7,3}^{(s)} \tag{3826a}$$

26.4.5 $A_2' : l = 8$

$$-Y_{8,6}^{(s)} \tag{3827a}$$

26.4.6 $A_2' : l = 9$

$$-Y_{9,9}^{(s)} \tag{3828a}$$

$$-Y_{9,3}^{(s)} \tag{3829a}$$

26.4.7 $A_2' : l = 10$

$$-Y_{10,6}^{(s)} \tag{3830a}$$

26.4.8 $A_2' : l = 11$

$$-Y_{11,9}^{(s)} \tag{3831a}$$

$$-Y_{11,3}^{(s)} \tag{3832a}$$

26.4.9 $A_2' : l = 12$

$$-Y_{12,12}^{(s)} \tag{3833a}$$

$$-Y_{12,6}^{(s)} \tag{3834a}$$

26.5 E'

26.5.1 $E' : l = 1$

$$-Y_{1,1}^{(s)} \tag{3835a}$$

$$Y_{1,1}^{(c)} \tag{3835b}$$

26.5.2 $E' : l = 2$

$$-Y_{2,2}^{(s)} \tag{3836a}$$

$$-Y_{2,2}^{(c)} \tag{3836b}$$

26.5.3 $E' : l = 3$

$$-Y_{3,1}^{(s)} \tag{3837a}$$

$$Y_{3,1}^{(c)} \tag{3837b}$$

26.5.4 $E' : l = 4$

$$-Y_{4,4}^{(s)} \tag{3838a}$$

$$Y_{4,4}^{(c)} \tag{3838b}$$

$$-Y_{4,2}^{(s)} \tag{3839a}$$

$$-Y_{4,2}^{(c)} \tag{3839b}$$

26.5.5 $E' : l = 5$

$$-Y_{5,1}^{(s)} \tag{3840a}$$

$$Y_{5,1}^{(c)} \tag{3840b}$$

$$-Y_{5,5}^{(s)} \tag{3841a}$$

$$-Y_{5,5}^{(c)} \tag{3841b}$$

26.5.6 $E' : l = 6$

$-Y_{6,4}^{(s)}$	(3842a)
$Y_{6,4}^{(c)}$	(3842b)
$-Y_{6,2}^{(s)}$	(3843a)
$-Y_{6,2}^{(c)}$	(3843b)

26.5.7 $E' : l = 7$

$-Y_{7,7}^{(s)}$	(3844a)
$Y_{7,7}^{(c)}$	(3844b)
$-Y_{7,5}^{(s)}$	(3845a)
$-Y_{7,5}^{(c)}$	(3845b)
$-Y_{7,1}^{(s)}$	(3846a)
$Y_{7,1}^{(c)}$	(3846b)

26.5.8 $E' : l = 8$

$Y_{8,2}^{(s)}$	(3847a)
$Y_{8,2}^{(c)}$	(3847b)
$-Y_{8,8}^{(s)}$	(3848a)
$-Y_{8,8}^{(c)}$	(3848b)
$-Y_{8,4}^{(s)}$	(3849a)
$Y_{8,4}^{(c)}$	(3849b)

26.5.9 $E' : l = 9$

$-Y_{9,5}^{(s)}$	(3850a)
$-Y_{9,5}^{(c)}$	(3850b)
$-Y_{9,1}^{(s)}$	(3851a)
$Y_{9,1}^{(c)}$	(3851b)
$-Y_{9,7}^{(s)}$	(3852a)
$Y_{9,7}^{(c)}$	(3852b)

26.5.10 $E' : l = 10$

$Y_{10,8}^{(s)}$	(3853a)
$Y_{10,8}^{(c)}$	(3853b)
$Y_{10,2}^{(s)}$	(3854a)
$Y_{10,2}^{(c)}$	(3854b)
$-Y_{10,4}^{(s)}$	(3855a)
$Y_{10,4}^{(c)}$	(3855b)
$-Y_{10,10}^{(s)}$	(3856a)
$Y_{10,10}^{(c)}$	(3856b)

26.5.11 $E' : l = 11$

$Y_{11,5}^{(s)}$	(3857a)
$Y_{11,5}^{(c)}$	(3857b)
$-Y_{11,1}^{(s)}$	(3858a)
$Y_{11,1}^{(c)}$	(3858b)
$-Y_{11,11}^{(s)}$	(3859a)
$-Y_{11,11}^{(c)}$	(3859b)
$-Y_{11,7}^{(s)}$	(3860a)
$Y_{11,7}^{(c)}$	(3860b)

26.5.12 $E' : l = 12$

$-Y_{12,2}^{(s)}$	(3861a)
$-Y_{12,2}^{(c)}$	(3861b)
$Y_{12,8}^{(s)}$	(3862a)
$Y_{12,8}^{(c)}$	(3862b)
$-Y_{12,10}^{(s)}$	(3863a)
$Y_{12,10}^{(c)}$	(3863b)
$-Y_{12,4}^{(s)}$	(3864a)
$Y_{12,4}^{(c)}$	(3864b)

26.6 E''

26.6.1 $E'' : l = 2$

$-Y_{2,1}^{(s)}$	(3865a)
$Y_{2,1}^{(c)}$	(3865b)

26.6.2 $E'' : l = 3$

$-Y_{3,2}^{(s)}$	(3866a)
$-Y_{3,2}^{(c)}$	(3866b)

26.6.3 $E'' : l = 4$

$-Y_{4,1}^{(s)}$	(3867a)
$Y_{4,1}^{(c)}$	(3867b)

26.6.4 $E'' : l = 5$

$-Y_{5,2}^{(s)}$	(3868a)
$-Y_{5,2}^{(c)}$	(3868b)
$-Y_{5,4}^{(s)}$	(3869a)
$Y_{5,4}^{(c)}$	(3869b)

26.6.5 $E'' : l = 6$

$-Y_{6,1}^{(s)}$	(3870a)
$Y_{6,1}^{(c)}$	(3870b)
$Y_{6,5}^{(s)}$	(3871a)
$Y_{6,5}^{(c)}$	(3871b)

26.6.6 $E'' : l = 7$

$-Y_{7,4}^{(s)}$	(3872a)
$Y_{7,4}^{(c)}$	(3872b)
$Y_{7,2}^{(s)}$	(3873a)
$Y_{7,2}^{(c)}$	(3873b)

26.6.7 $E'' : l = 8$

$-Y_{8,7}^{(s)}$	(3874a)
$Y_{8,7}^{(c)}$	(3874b)
$Y_{8,5}^{(s)}$	(3875a)
$Y_{8,5}^{(c)}$	(3875b)
$-Y_{8,1}^{(s)}$	(3876a)
$Y_{8,1}^{(c)}$	(3876b)

26.6.8 $E'' : l = 9$

$-Y_{9,4}^{(s)}$	(3877a)
$Y_{9,4}^{(c)}$	(3877b)
$-Y_{9,2}^{(s)}$	(3878a)
$-Y_{9,2}^{(c)}$	(3878b)
$Y_{9,8}^{(s)}$	(3879a)
$Y_{9,8}^{(c)}$	(3879b)

26.6.9 $E'' : l = 10$

$-Y_{10,7}^{(s)}$	(3880a)
$Y_{10,7}^{(c)}$	(3880b)
$Y_{10,5}^{(s)}$	(3881a)
$Y_{10,5}^{(c)}$	(3881b)
$-Y_{10,1}^{(s)}$	(3882a)
$Y_{10,1}^{(c)}$	(3882b)

26.6.10 $E'' : l = 11$

$-Y_{11,10}^{(s)}$	(3883a)
$Y_{11,10}^{(c)}$	(3883b)
$-Y_{11,2}^{(s)}$	(3884a)
$-Y_{11,2}^{(c)}$	(3884b)
$-Y_{11,4}^{(s)}$	(3885a)
$Y_{11,4}^{(c)}$	(3885b)
$-Y_{11,8}^{(s)}$	(3886a)
$-Y_{11,8}^{(c)}$	(3886b)

26.6.11 $E'' : l = 12$

$-Y_{12,7}^{(s)}$	(3887a)
$Y_{12,7}^{(c)}$	(3887b)
$-Y_{12,11}^{(s)}$	(3888a)
$-Y_{12,11}^{(c)}$	(3888b)
$-Y_{12,1}^{(s)}$	(3889a)
$Y_{12,1}^{(c)}$	(3889b)
$Y_{12,5}^{(s)}$	(3890a)
$Y_{12,5}^{(c)}$	(3890b)

27 Group D_{6h}

27.1 A_{1g}

27.1.1 $A_{1g} : l = 0$

$$Y_{0,0}^{(c)} \tag{3891a}$$

27.1.2 $A_{1g} : l = 2$

$$Y_{2,0}^{(c)} \tag{3892a}$$

27.1.3 $A_{1g} : l = 4$

$$Y_{4,0}^{(c)} \tag{3893a}$$

27.1.4 $A_{1g} : l = 6$

$$Y_{6,6}^{(c)} \tag{3894a}$$

$$Y_{6,0}^{(c)} \tag{3895a}$$

27.1.5 $A_{1g} : l = 8$

$$Y_{8,6}^{(c)} \tag{3896a}$$

$$Y_{8,0}^{(c)} \tag{3897a}$$

27.1.6 $A_{1g} : l = 10$

$$Y_{10,6}^{(c)} \tag{3898a}$$

$$Y_{10,0}^{(c)} \tag{3899a}$$

27.1.7 $A_{1g} : l = 12$

$$Y_{12,12}^{(c)} \tag{3900a}$$

$$Y_{12,0}^{(c)} \tag{3901a}$$

$$Y_{12,6}^{(c)} \tag{3902a}$$

27.2 A_{2u}

27.2.1 $A_{2u} : l = 1$

$$Y_{1,0}^{(c)} \tag{3903a}$$

27.2.2 $A_{2u} : l = 3$

$$Y_{3,0}^{(c)} \tag{3904a}$$

27.2.3 $A_{2u} : l = 5$

$$Y_{5,0}^{(c)} \tag{3905a}$$

27.2.4 $A_{2u} : l = 7$

$$Y_{7,6}^{(c)} \tag{3906a}$$

$$Y_{7,0}^{(c)} \tag{3907a}$$

27.2.5 $A_{2u} : l = 9$

$$Y_{9,0}^{(c)} \tag{3908a}$$

$$Y_{9,6}^{(c)} \tag{3909a}$$

27.2.6 $A_{2u} : l = 11$

$$Y_{11,6}^{(c)} \tag{3910a}$$

$$Y_{11,0}^{(c)} \tag{3911a}$$

27.3 A_{1u}

27.3.1 $A_{1u} : l = 7$

$$-Y_{7,6}^{(s)} \tag{3912a}$$

27.3.2 $A_{1u} : l = 9$

$$-Y_{9,6}^{(s)} \tag{3913a}$$

27.3.3 $A_{1u} : l = 11$

$$-Y_{11,6}^{(s)} \tag{3914a}$$

27.4 B_{1g}

27.4.1 $B_{1g} : l = 4$

$$-Y_{4,3}^{(s)} \tag{3915a}$$

27.4.2 $B_{1g} : l = 6$

$$-Y_{6,3}^{(s)} \tag{3916a}$$

27.4.3 $B_{1g} : l = 8$

$$-Y_{8,3}^{(s)} \tag{3917a}$$

27.4.4 $B_{1g} : l = 10$

$$-Y_{10,3}^{(s)} \tag{3918a}$$

$$-Y_{10,9}^{(s)} \tag{3919a}$$

27.4.5 $B_{1g} : l = 12$

$$-Y_{12,3}^{(s)} \tag{3920a}$$

$$-Y_{12,9}^{(s)} \tag{3921a}$$

27.5 B_{2g}

27.5.1 $B_{2g} : l = 4$

$$Y_{4,3}^{(c)} \tag{3922a}$$

27.5.2 $B_{2g} : l = 6$

$$Y_{6,3}^{(c)} \tag{3923a}$$

27.5.3 $B_{2g} : l = 8$

$$Y_{8,3}^{(c)} \tag{3924a}$$

27.5.4 $B_{2g} : l = 10$

$$Y_{10,9}^{(c)} \tag{3925a}$$

$$Y_{10,3}^{(c)} \tag{3926a}$$

27.5.5 $B_{2g} : l = 12$

$$Y_{12,9}^{(c)} \tag{3927a}$$

$$Y_{12,3}^{(c)} \tag{3928a}$$

27.6 B_{1u}

27.6.1 $B_{1u} : l = 3$

$$Y_{3,3}^{(c)} \tag{3929a}$$

27.6.2 $B_{1u} : l = 5$

$$Y_{5,3}^{(c)} \tag{3930a}$$

27.6.3 $B_{1u} : l = 7$

$$Y_{7,3}^{(c)} \tag{3931a}$$

27.6.4 $B_{1u} : l = 9$

$$Y_{9,9}^{(c)} \tag{3932a}$$

$$Y_{9,3}^{(c)} \tag{3933a}$$

27.6.5 $B_{1u} : l = 11$

$$Y_{11,3}^{(c)} \tag{3934a}$$

$$Y_{11,9}^{(c)} \tag{3935a}$$

27.7 B_{2u}

27.7.1 $B_{2u} : l = 3$

$$-Y_{3,3}^{(s)} \tag{3936a}$$

27.7.2 $B_{2u} : l = 5$

$$-Y_{5,3}^{(s)} \tag{3937a}$$

27.7.3 $B_{2u} : l = 7$

$$-Y_{7,3}^{(s)} \tag{3938a}$$

27.7.4 $B_{2u} : l = 9$

$$-Y_{9,9}^{(s)} \tag{3939a}$$

$$-Y_{9,3}^{(s)} \tag{3940a}$$

27.7.5 $B_{2u} : l = 11$

$$-Y_{11,9}^{(s)} \tag{3941a}$$

$$-Y_{11,3}^{(s)} \tag{3942a}$$

27.8 A_{2g}

27.8.1 $A_{2g} : l = 6$

$$-Y_{6,6}^{(s)} \tag{3943a}$$

27.8.2 $A_{2g} : l = 8$

$$-Y_{8,6}^{(s)} \tag{3944a}$$

27.8.3 $A_{2g} : l = 10$

$$-Y_{10,6}^{(s)} \tag{3945a}$$

27.8.4 $A_{2g} : l = 12$

$$-Y_{12,12}^{(s)} \tag{3946a}$$

$$-Y_{12,6}^{(s)} \tag{3947a}$$

27.9 E_{2g}

27.9.1 $E_{2g} : l = 2$

$$-Y_{2,2}^{(s)} \tag{3948a}$$

$$Y_{2,2}^{(c)} \tag{3948b}$$

27.9.2 $E_{2g} : l = 4$

$$Y_{4,4}^{(s)} \tag{3949a}$$

$$Y_{4,4}^{(c)} \tag{3949b}$$

$$-Y_{4,2}^{(s)} \tag{3950a}$$

$$Y_{4,2}^{(c)} \tag{3950b}$$

27.9.3 $E_{2g} : l = 6$

$$-Y_{6,2}^{(s)} \tag{3951a}$$

$$Y_{6,2}^{(c)} \tag{3951b}$$

$$Y_{6,4}^{(s)} \tag{3952a}$$

$$Y_{6,4}^{(c)} \tag{3952b}$$

27.9.4 $E_{2g} : l = 8$

$-Y^{(s)}_{8,8}$ (3953a)

$Y^{(c)}_{8,8}$ (3953b)

$Y^{(s)}_{8,4}$ (3954a)

$Y^{(c)}_{8,4}$ (3954b)

$-Y^{(s)}_{8,2}$ (3955a)

$Y^{(c)}_{8,2}$ (3955b)

27.9.5 $E_{2g} : l = 10$

$-Y^{(s)}_{10,8}$ (3956a)

$Y^{(c)}_{10,8}$ (3956b)

$Y^{(s)}_{10,10}$ (3957a)

$Y^{(c)}_{10,10}$ (3957b)

$Y^{(s)}_{10,4}$ (3958a)

$Y^{(c)}_{10,4}$ (3958b)

$-Y^{(s)}_{10,2}$ (3959a)

$Y^{(c)}_{10,2}$ (3959b)

27.9.6 $E_{2g} : l = 12$

$Y^{(s)}_{12,10}$ (3960a)

$Y^{(c)}_{12,10}$ (3960b)

$-Y^{(s)}_{12,2}$ (3961a)

$Y^{(c)}_{12,2}$ (3961b)

$Y^{(s)}_{12,4}$ (3962a)

$Y^{(c)}_{12,4}$ (3962b)

$-Y^{(s)}_{12,8}$ (3963a)

$Y^{(c)}_{12,8}$ (3963b)

27.10 E_{1u}
27.10.1 $E_{1u} : l = 1$

$-Y^{(s)}_{1,1}$ (3964a)

$Y^{(c)}_{1,1}$ (3964b)

27.10.2 $E_{1u} : l = 3$

$-Y^{(s)}_{3,1}$ (3965a)

$Y^{(c)}_{3,1}$ (3965b)

27.10.3 $E_{1u} : l = 5$

$Y^{(s)}_{5,5}$ (3966a)

$Y^{(c)}_{5,5}$ (3966b)

$-Y^{(s)}_{5,1}$ (3967a)

$Y^{(c)}_{5,1}$ (3967b)

27.10.4 $E_{1u} : l = 7$

$-Y^{(s)}_{7,7}$ (3968a)

$Y^{(c)}_{7,7}$ (3968b)

$-Y^{(s)}_{7,5}$ (3969a)

$-Y^{(c)}_{7,5}$ (3969b)

$-Y^{(s)}_{7,1}$ (3970a)

$Y^{(c)}_{7,1}$ (3970b)

27.10.5 $E_{1u} : l = 9$

$-Y^{(s)}_{9,7}$ (3971a)

$Y^{(c)}_{9,7}$ (3971b)

$Y^{(s)}_{9,5}$ (3972a)

$Y^{(c)}_{9,5}$ (3972b)

$-Y^{(s)}_{9,1}$ (3973a)

$Y^{(c)}_{9,1}$ (3973b)

27.10.6 $E_{1u} : l = 11$

$Y^{(s)}_{11,11}$ (3974a)

$Y^{(c)}_{11,11}$ (3974b)

$-Y^{(s)}_{11,1}$ (3975a)

$Y^{(c)}_{11,1}$ (3975b)

$-Y^{(s)}_{11,7}$ (3976a)

$Y^{(c)}_{11,7}$ (3976b)

$-Y^{(s)}_{11,5}$ (3977a)

$-Y^{(c)}_{11,5}$ (3977b)

27.11 E_{1g}
27.11.1 $E_{1g} : l = 2$

$-Y^{(s)}_{2,1}$ (3978a)

$Y^{(c)}_{2,1}$ (3978b)

27.11.2 $E_{1g} : l = 4$

$-Y^{(s)}_{4,1}$ (3979a)

$Y^{(c)}_{4,1}$ (3979b)

27.11.3 $E_{1g} : l = 6$

$-Y^{(s)}_{6,1}$ (3980a)

$Y^{(c)}_{6,1}$ (3980b)

$-Y^{(s)}_{6,5}$ (3981a)

$-Y^{(c)}_{6,5}$ (3981b)

27.11.4 $E_{1g} : l = 8$

$-Y^{(s)}_{8,5}$ (3982a)

$-Y^{(c)}_{8,5}$ (3982b)

$-Y^{(s)}_{8,1}$ (3983a)

$Y^{(c)}_{8,1}$ (3983b)

$-Y^{(s)}_{8,7}$ (3984a)

$Y^{(c)}_{8,7}$ (3984b)

27.11.5 $E_{1g} : l = 10$

$Y^{(s)}_{10,5}$ (3985a)

$Y^{(c)}_{10,5}$ (3985b)

$-Y^{(s)}_{10,7}$ (3986a)

$Y^{(c)}_{10,7}$ (3986b)

$-Y^{(s)}_{10,1}$ (3987a)

$Y^{(c)}_{10,1}$ (3987b)

27.11.6 $E_{1g} : l = 12$

$Y^{(s)}_{12,5}$ (3988a)

$Y^{(c)}_{12,5}$ (3988b)

$Y^{(s)}_{12,11}$ (3989a)

$Y^{(c)}_{12,11}$ (3989b)

$-Y^{(s)}_{12,7}$ (3990a)

$Y^{(c)}_{12,7}$ (3990b)

$-Y^{(s)}_{12,1}$ (3991a)

$Y^{(c)}_{12,1}$ (3991b)

27.12 E_{2u}
27.12.1 $E_{2u} : l = 3$

$-Y^{(s)}_{3,2}$ (3992a)

$Y^{(c)}_{3,2}$ (3992b)

27.12.2 $E_{2u} : l = 5$

$-Y^{(s)}_{5,2}$ (3993a)

$Y^{(c)}_{5,2}$ (3993b)

$Y^{(s)}_{5,4}$ (3994a)

$Y^{(c)}_{5,4}$ (3994b)

27.12.3 $E_{2u} : l = 7$

$Y^{(s)}_{7,4}$ (3995a)

$Y^{(c)}_{7,4}$ (3995b)

$-Y^{(s)}_{7,2}$ (3996a)

$Y^{(c)}_{7,2}$ (3996b)

27.12.4 $E_{2u} : l = 9$

$-Y^{(s)}_{9,2}$ (3997a)

$Y^{(c)}_{9,2}$ (3997b)

$Y^{(s)}_{9,4}$ (3998a)

$Y^{(c)}_{9,4}$ (3998b)

$-Y^{(s)}_{9,8}$ (3999a)

$Y^{(c)}_{9,8}$ (3999b)

27.12.5 $E_{2u} : l = 11$

$-Y^{(s)}_{11,2}$ (4000a)

$Y^{(c)}_{11,2}$ (4000b)

$Y^{(s)}_{11,4}$ (4001a)

$Y^{(c)}_{11,4}$ (4001b)

$-Y^{(s)}_{11,8}$ (4002a)

$Y^{(c)}_{11,8}$ (4002b)

$Y^{(s)}_{11,10}$ (4003a)

$Y^{(c)}_{11,10}$ (4003b)

28 Group T

28.1 A

28.1.1 $A : l = 0$

$$Y_{0,0}^{(c)} \tag{4004a}$$

28.1.2 $A : l = 3$

$$-Y_{3,2}^{(s)} \tag{4005a}$$

28.1.3 $A : l = 4$

$$\frac{\sqrt{21}Y_{4,0}^{(c)}}{6} + \frac{\sqrt{15}Y_{4,4}^{(c)}}{6} \tag{4006a}$$

28.1.4 $A : l = 6$

$$\frac{\sqrt{11}Y_{6,2}^{(c)}}{4} - \frac{\sqrt{5}Y_{6,6}^{(c)}}{4} \tag{4007a}$$

$$-\frac{\sqrt{2}Y_{6,0}^{(c)}}{4} + \frac{\sqrt{14}Y_{6,4}^{(c)}}{4} \tag{4008a}$$

28.1.5 $A : l = 7$

$$-\frac{\sqrt{78}Y_{7,2}^{(s)}}{12} - \frac{\sqrt{66}Y_{7,6}^{(s)}}{12} \tag{4009a}$$

28.1.6 $A : l = 8$

$$\frac{\sqrt{33}Y_{8,0}^{(c)}}{8} + \frac{\sqrt{21}Y_{8,4}^{(c)}}{12} + \frac{\sqrt{195}Y_{8,8}^{(c)}}{24} \tag{4010a}$$

28.1.7 $A : l = 9$

$$-\frac{\sqrt{102}Y_{9,4}^{(s)}}{12} + \frac{\sqrt{42}Y_{9,8}^{(s)}}{12} \tag{4011a}$$

$$\frac{\sqrt{3}Y_{9,2}^{(s)}}{4} - \frac{\sqrt{13}Y_{9,6}^{(s)}}{4} \tag{4012a}$$

28.1.8 $A : l = 10$

$$-\frac{\sqrt{85}Y_{10,10}^{(c)}}{16} + \frac{\sqrt{1482}Y_{10,2}^{(c)}}{48} + \frac{\sqrt{57}Y_{10,6}^{(c)}}{48} \tag{4013a}$$

$$\frac{\sqrt{390}Y_{10,0}^{(c)}}{48} - \frac{\sqrt{22}Y_{10,4}^{(c)}}{8} - \frac{\sqrt{1122}Y_{10,8}^{(c)}}{48} \tag{4014a}$$

28.1.9 $A : l = 11$

$$-\frac{\sqrt{798}Y_{11,10}^{(s)}}{48} - \frac{\sqrt{255}Y_{11,2}^{(s)}}{24} - \frac{3\sqrt{6}Y_{11,6}^{(s)}}{16} \tag{4015a}$$

28.1.10 $A : l = 12$

$$\frac{\sqrt{627}Y_{12,10}^{(c)}}{48} + \frac{\sqrt{102}Y_{12,2}^{(c)}}{48} - \frac{5\sqrt{7}Y_{12,6}^{(c)}}{16} \tag{4016a}$$

$$\frac{\sqrt{109467930}Y_{12,0}^{(c)}}{37920} + \frac{\sqrt{2098635}Y_{12,12}^{(c)}}{37920} - \frac{3\sqrt{2679285}Y_{12,4}^{(c)}}{12640} + \frac{\sqrt{790}Y_{12,8}^{(c)}}{32} \tag{4017a}$$

$$\frac{\sqrt{63595}Y_{12,0}^{(c)}}{395} + \frac{\sqrt{3317210}Y_{12,12}^{(c)}}{3160} + \frac{\sqrt{2598310}Y_{12,4}^{(c)}}{3160} \tag{4018a}$$

28.2 E^1

28.2.1 $E^1 : l = 2$

$$\frac{\sqrt{2}Y_{2,0}^{(c)}}{2} - \frac{\sqrt{2}iY_{2,2}^{(c)}}{2} \tag{4019a}$$

28.2.2 $E^1 : l = 4$

$$\frac{\sqrt{30}Y_{4,0}^{(c)}}{12} + \frac{\sqrt{2}iY_{4,2}^{(c)}}{2} - \frac{\sqrt{42}Y_{4,4}^{(c)}}{12} \tag{4020a}$$

28.2.3 $E^1 : l = 5$

$$-\frac{\sqrt{2}Y_{5,2}^{(s)}}{2} + \frac{\sqrt{2}iY_{5,4}^{(s)}}{2} \tag{4021a}$$

28.2.4 $E^1 : l = 6$

$$\frac{\sqrt{7}Y_{6,0}^{(c)}}{4} - \frac{\sqrt{10}iY_{6,2}^{(c)}}{8} + \frac{Y_{6,4}^{(c)}}{4} - \frac{\sqrt{22}iY_{6,6}^{(c)}}{8} \tag{4022a}$$

28.2.5 $E^1 : l = 7$

$$-\frac{\sqrt{33}Y_{7,2}^{(s)}}{12} - \frac{\sqrt{2}iY_{7,4}^{(s)}}{2} + \frac{\sqrt{39}Y_{7,6}^{(s)}}{12} \tag{4023a}$$

28.2.6 $E^1 : l = 8$

$$-\frac{\sqrt{143}iY_{8,0}^{(c)}}{32} + \frac{\sqrt{91}iY_{8,4}^{(c)}}{16} + \frac{\sqrt{2}Y_{8,6}^{(c)}}{2} + \frac{\sqrt{5}iY_{8,8}^{(c)}}{32} \tag{4024a}$$

$$\frac{\sqrt{105}Y_{8,0}^{(c)}}{32} + \frac{\sqrt{2}iY_{8,2}^{(c)}}{2} + \frac{\sqrt{165}Y_{8,4}^{(c)}}{48} - \frac{\sqrt{3003}Y_{8,8}^{(c)}}{96} \tag{4025a}$$

28.2.7 $E^1 : l = 9$

$$-\frac{\sqrt{26}Y_{9,2}^{(s)}}{8} + \frac{\sqrt{21}iY_{9,4}^{(s)}}{12} - \frac{\sqrt{6}Y_{9,6}^{(s)}}{8} + \frac{\sqrt{51}iY_{9,8}^{(s)}}{12} \tag{4026a}$$

28.2.8 $E^1 : l = 10$

$$\frac{3\sqrt{1606605}iY_{10,0}^{(c)}}{11984} + \frac{\sqrt{2419270}Y_{10,10}^{(c)}}{23968} - \frac{19\sqrt{29211}Y_{10,2}^{(c)}}{35952} - \frac{83\sqrt{749}iY_{10,4}^{(c)}}{5992} + \frac{\sqrt{4494}Y_{10,6}^{(c)}}{96} + \frac{31\sqrt{38199}iY_{10,8}^{(c)}}{11984} \tag{4027a}$$

$$\frac{11\sqrt{840378}iY_{10,0}^{(c)}}{17976} + \frac{\sqrt{185003}Y_{10,10}^{(c)}}{749} + \frac{\sqrt{381990}Y_{10,2}^{(c)}}{1498} + \frac{\sqrt{1655290}iY_{10,4}^{(c)}}{2996} - \frac{\sqrt{292110}iY_{10,8}^{(c)}}{17976} \tag{4028a}$$

28.2.9 $E^1 : l = 11$

$$-\frac{\sqrt{753}Y_{11,10}^{(s)}}{48} + \frac{\sqrt{17025330}Y_{11,2}^{(s)}}{12048} + \frac{\sqrt{486438}iY_{11,4}^{(s)}}{1004} + \frac{3\sqrt{100149}Y_{11,6}^{(s)}}{4016} + \frac{\sqrt{17570}iY_{11,8}^{(s)}}{1004} \tag{4029a}$$

$$-\frac{9\sqrt{502}iY_{11,2}^{(s)}}{502} - \frac{\sqrt{17570}Y_{11,4}^{(s)}}{1004} + \frac{\sqrt{21335}iY_{11,6}^{(s)}}{251} + \frac{\sqrt{486438}Y_{11,8}^{(s)}}{1004} \tag{4030a}$$

28.2.10 $E^1 : l = 12$

$$-\frac{\sqrt{10659}Y_{12,0}^{(c)}}{288} - \frac{29\sqrt{6006}iY_{12,10}^{(c)}}{3744} - \frac{\sqrt{138138}Y_{12,12}^{(c)}}{7488} + \frac{\sqrt{88179}iY_{12,2}^{(c)}}{1872} + \frac{\sqrt{176358}Y_{12,4}^{(c)}}{832} - \frac{19\sqrt{494}iY_{12,6}^{(c)}}{1248} + \frac{3\sqrt{13}Y_{12,8}^{(c)}}{32} \tag{4031a}$$

$$-\frac{\sqrt{42}iY_{12,0}^{(c)}}{18} + \frac{\sqrt{12597}Y_{12,10}^{(c)}}{1872} + \frac{\sqrt{289731}iY_{12,12}^{(c)}}{936} + \frac{43\sqrt{858}Y_{12,2}^{(c)}}{1872} - \frac{\sqrt{429}iY_{12,4}^{(c)}}{104} + \frac{\sqrt{17017}Y_{12,6}^{(c)}}{624} \tag{4032a}$$

28.3 E^2

28.3.1 $E^2 : l = 2$

$$\frac{\sqrt{2}Y_{2,0}^{(c)}}{2} + \frac{\sqrt{2}iY_{2,2}^{(c)}}{2} \tag{4033a}$$

28.3.2 $E^2 : l = 4$

$$\frac{\sqrt{30}Y_{4,0}^{(c)}}{12} - \frac{\sqrt{2}iY_{4,2}^{(c)}}{2} - \frac{\sqrt{42}Y_{4,4}^{(c)}}{12} \tag{4034a}$$

28.3.3 $E^2 : l = 5$

$$-\frac{\sqrt{2}Y_{5,2}^{(s)}}{2} - \frac{\sqrt{2}iY_{5,4}^{(s)}}{2} \tag{4035a}$$

28.3.4 $E^2 : l = 6$

$$\frac{\sqrt{7}Y_{6,0}^{(c)}}{4} + \frac{\sqrt{10}iY_{6,2}^{(c)}}{8} + \frac{Y_{6,4}^{(c)}}{4} + \frac{\sqrt{22}iY_{6,6}^{(c)}}{8} \tag{4036a}$$

28.3.5 $E^2 : l = 7$

$$-\frac{\sqrt{33}iY_{7,2}^{(s)}}{12} - \frac{\sqrt{2}Y_{7,4}^{(s)}}{2} + \frac{\sqrt{39}iY_{7,6}^{(s)}}{12} \tag{4037a}$$

28.3.6 $E^2 : l = 8$

$$-\frac{\sqrt{18942}Y_{8,0}^{(c)}}{656} - \frac{\sqrt{2255}iY_{8,2}^{(c)}}{164} + \frac{\sqrt{246}Y_{8,4}^{(c)}}{24} + \frac{\sqrt{11193}iY_{8,6}^{(c)}}{164} - \frac{\sqrt{111930}Y_{8,8}^{(c)}}{1968} \tag{4038a}$$

$$-\frac{\sqrt{5330}Y_{8,0}^{(c)}}{164} + \frac{\sqrt{11193}iY_{8,2}^{(c)}}{164} + \frac{\sqrt{2255}iY_{8,6}^{(c)}}{164} + \frac{3\sqrt{902}Y_{8,8}^{(c)}}{164} \tag{4039a}$$

28.3.7 $E^2 : l = 9$

$$\frac{\sqrt{26}iY_{9,2}^{(s)}}{8} - \frac{\sqrt{21}Y_{9,4}^{(s)}}{12} + \frac{\sqrt{6}iY_{9,6}^{(s)}}{8} - \frac{\sqrt{51}Y_{9,8}^{(s)}}{12} \tag{4040a}$$

28.3.8 $E^2 : l = 10$

$$-\frac{3\sqrt{1606605}iY_{10,0}^{(c)}}{11984} + \frac{\sqrt{2419270}Y_{10,10}^{(c)}}{23968} - \frac{19\sqrt{29211}Y_{10,2}^{(c)}}{35952} + \frac{83\sqrt{749}iY_{10,4}^{(c)}}{5992} + \frac{\sqrt{4494}Y_{10,6}^{(c)}}{96} - \frac{31\sqrt{38199}iY_{10,8}^{(c)}}{11984} \tag{4041a}$$

$$\frac{11\sqrt{840378}iY_{10,0}^{(c)}}{17976} + \frac{\sqrt{185003}Y_{10,10}^{(c)}}{749} + \frac{\sqrt{381990}iY_{10,2}^{(c)}}{1498} + \frac{\sqrt{1655290}Y_{10,4}^{(c)}}{2996} - \frac{\sqrt{292110}iY_{10,8}^{(c)}}{17976} \tag{4042a}$$

28.3.9 $E^2 : l = 11$

$$\frac{\sqrt{3628905}Y_{11,10}^{(s)}}{5136} - \frac{\sqrt{642}Y_{11,2}^{(s)}}{48} + \frac{\sqrt{22470}iY_{11,4}^{(s)}}{428} + \frac{3\sqrt{27285}Y_{11,6}^{(s)}}{1712} + \frac{\sqrt{69122}iY_{11,8}^{(s)}}{428}$$

(4043a)

$$-\frac{9\sqrt{107}iY_{11,10}^{(s)}}{214} + \frac{\sqrt{69122}Y_{11,4}^{(s)}}{428} + \frac{\sqrt{1423}iY_{11,6}^{(s)}}{214} - \frac{\sqrt{22470}Y_{11,8}^{(s)}}{428}$$

(4044a)

28.3.10 $E^2 : l = 12$

$$-\frac{\sqrt{10659}Y_{12,0}^{(c)}}{288} + \frac{29\sqrt{6006}iY_{12,10}^{(c)}}{3744} - \frac{\sqrt{138138}Y_{12,12}^{(c)}}{7488} - \frac{\sqrt{88179}iY_{12,2}^{(c)}}{1872} + \frac{\sqrt{176358}Y_{12,4}^{(c)}}{832} + \frac{19\sqrt{494}iY_{12,6}^{(c)}}{1248} + \frac{3\sqrt{13}Y_{12,8}^{(c)}}{32}$$

(4045a)

$$-\frac{\sqrt{42}Y_{12,0}^{(c)}}{18} + \frac{\sqrt{12597}iY_{12,10}^{(c)}}{1872} + \frac{\sqrt{289731}Y_{12,12}^{(c)}}{936} + \frac{43\sqrt{858}iY_{12,2}^{(c)}}{1872} - \frac{\sqrt{429}Y_{12,4}^{(c)}}{104} + \frac{\sqrt{17017}iY_{12,6}^{(c)}}{624}$$

(4046a)

28.4 T

28.4.1 $T : l = 1$

$$-Y_{1,1}^{(s)}$$

(4047a)

$$Y_{1,0}^{(c)}$$

(4047b)

$$Y_{1,1}^{(c)}$$

(4047c)

28.4.2 $T : l = 2$

$$Y_{2,1}^{(c)}$$

(4048a)

$$-Y_{2,2}^{(s)}$$

(4048b)

$$-Y_{2,1}^{(s)}$$

(4048c)

28.4.3 $T : l = 3$

$$\frac{\sqrt{6}Y_{3,1}^{(s)}}{4} + \frac{\sqrt{10}Y_{3,3}^{(s)}}{4}$$

(4049a)

$$Y_{3,0}^{(c)}$$

(4049b)

$$-\frac{\sqrt{6}Y_{3,1}^{(c)}}{4} + \frac{\sqrt{10}Y_{3,3}^{(c)}}{4}$$

(4049c)

$$-\frac{\sqrt{10}Y_{3,1}^{(s)}}{4} + \frac{\sqrt{6}Y_{3,3}^{(s)}}{4}$$

(4050a)

$$Y_{3,2}^{(c)}$$

(4050b)

$$-\frac{\sqrt{10}Y_{3,1}^{(c)}}{4} - \frac{\sqrt{6}Y_{3,3}^{(c)}}{4}$$

(4050c)

28.4.4 $T : l = 4$

$$-\frac{\sqrt{7}Y_{4,1}^{(c)}}{4} - \frac{3Y_{4,3}^{(c)}}{4}$$

(4051a)

$$-\frac{\sqrt{14}Y_{4,2}^{(s)}}{4} + \frac{\sqrt{2}Y_{4,4}^{(s)}}{4}$$

(4051b)

$$-Y_{4,3}^{(s)}$$

(4051c)

$$\frac{3Y_{4,1}^{(c)}}{4} - \frac{\sqrt{7}Y_{4,3}^{(c)}}{4}$$

(4052a)

$$-\frac{\sqrt{2}Y_{4,2}^{(s)}}{4} - \frac{\sqrt{14}Y_{4,4}^{(s)}}{4}$$

(4052b)

$$Y_{4,1}^{(s)}$$

(4052c)

28.4.5 $T : l = 5$

$$-\frac{\sqrt{21}Y_{5,1}^{(s)}}{8} + \frac{9\sqrt{2}Y_{5,3}^{(s)}}{16} - \frac{\sqrt{10}Y_{5,5}^{(s)}}{16}$$

(4053a)

$$Y_{5,4}^{(c)}$$

(4053b)

$$\frac{\sqrt{21}Y_{5,1}^{(c)}}{8} + \frac{9\sqrt{2}Y_{5,3}^{(c)}}{16} + \frac{\sqrt{10}Y_{5,5}^{(c)}}{16}$$

(4053c)

$$-\frac{\sqrt{15}Y_{5,1}^{(s)}}{8} - \frac{\sqrt{70}Y_{5,3}^{(s)}}{16} - \frac{3\sqrt{14}Y_{5,5}^{(s)}}{16}$$

(4054a)

$$Y_{5,0}^{(c)}$$

(4054b)

$$\frac{\sqrt{15}Y_{5,1}^{(c)}}{8} - \frac{\sqrt{70}Y_{5,3}^{(c)}}{16} + \frac{3\sqrt{14}Y_{5,5}^{(c)}}{16}$$

(4054c)

$$\frac{\sqrt{7}Y_{5,1}^{(s)}}{4} + \frac{\sqrt{6}Y_{5,3}^{(s)}}{8} - \frac{\sqrt{30}Y_{5,5}^{(s)}}{8}$$

(4055a)

$$Y_{5,2}^{(c)}$$

(4055b)

$$\frac{\sqrt{7}Y_{5,1}^{(c)}}{4} - \frac{\sqrt{6}Y_{5,3}^{(c)}}{8} - \frac{\sqrt{30}Y_{5,5}^{(c)}}{8}$$

(4055c)

28.4.6 $T : l = 6$

$$\frac{\sqrt{66}Y_{6,1}^{(c)}}{16} + \frac{\sqrt{165}Y_{6,3}^{(c)}}{16} + \frac{5Y_{6,5}^{(c)}}{16} \tag{4056a}$$

$$-\frac{\sqrt{165}Y_{6,2}^{(s)}}{16} + \frac{\sqrt{22}Y_{6,4}^{(s)}}{8} - \frac{\sqrt{3}Y_{6,6}^{(s)}}{16} \tag{4056b}$$

$$-Y_{6,5}^{(s)} \tag{4056c}$$

$$\frac{45\sqrt{46}Y_{6,1}^{(c)}}{368} - \frac{19\sqrt{115}Y_{6,3}^{(c)}}{368} + \frac{\sqrt{759}Y_{6,5}^{(c)}}{368} \tag{4057a}$$

$$\frac{3\sqrt{115}Y_{6,2}^{(s)}}{368} - \frac{\sqrt{138}Y_{6,4}^{(s)}}{184} - \frac{\sqrt{253}Y_{6,6}^{(s)}}{16} \tag{4057b}$$

$$-\frac{3\sqrt{46}Y_{6,1}^{(s)}}{23} - \frac{\sqrt{115}Y_{6,3}^{(s)}}{23} \tag{4057c}$$

$$\frac{\sqrt{115}Y_{6,1}^{(c)}}{46} + \frac{3\sqrt{46}Y_{6,3}^{(c)}}{92} - \frac{\sqrt{7590}Y_{6,5}^{(c)}}{92} \tag{4058a}$$

$$\frac{2\sqrt{46}Y_{6,2}^{(s)}}{23} + \frac{\sqrt{345}Y_{6,4}^{(s)}}{23} \tag{4058b}$$

$$\frac{\sqrt{115}Y_{6,1}^{(s)}}{23} - \frac{3\sqrt{46}Y_{6,3}^{(s)}}{23} \tag{4058c}$$

28.4.7 $T : l = 7$

$$\frac{5\sqrt{7}Y_{7,1}^{(s)}}{32} + \frac{3\sqrt{21}Y_{7,3}^{(s)}}{32} + \frac{\sqrt{231}Y_{7,5}^{(s)}}{32} + \frac{\sqrt{429}Y_{7,7}^{(s)}}{32} \tag{4059a}$$

$$Y_{7,0}^{(c)} \tag{4059b}$$

$$-\frac{5\sqrt{7}Y_{7,1}^{(c)}}{32} + \frac{3\sqrt{21}Y_{7,3}^{(c)}}{32} - \frac{\sqrt{231}Y_{7,5}^{(c)}}{32} + \frac{\sqrt{429}Y_{7,7}^{(c)}}{32} \tag{4059c}$$

$$-\frac{\sqrt{858}Y_{7,1}^{(s)}}{64} + \frac{3\sqrt{286}Y_{7,3}^{(s)}}{64} - \frac{5\sqrt{26}Y_{7,5}^{(s)}}{64} + \frac{\sqrt{14}Y_{7,7}^{(s)}}{64} \tag{4060a}$$

$$Y_{7,6}^{(c)} \tag{4060b}$$

$$-\frac{\sqrt{858}Y_{7,1}^{(c)}}{64} - \frac{3\sqrt{286}Y_{7,3}^{(c)}}{64} - \frac{5\sqrt{26}Y_{7,5}^{(c)}}{64} - \frac{\sqrt{14}Y_{7,7}^{(c)}}{64} \tag{4060c}$$

$$\frac{9\sqrt{858}Y_{7,1}^{(s)}}{832} + \frac{21\sqrt{286}Y_{7,3}^{(s)}}{832} + \frac{61\sqrt{26}Y_{7,5}^{(s)}}{832} - \frac{13\sqrt{14}Y_{7,7}^{(s)}}{64} \tag{4061a}$$

$$-\frac{\sqrt{143}Y_{7,2}^{(c)}}{13} - \frac{\sqrt{26}Y_{7,4}^{(c)}}{13} \tag{4061b}$$

$$\frac{21\sqrt{858}Y_{7,1}^{(c)}}{832} - \frac{17\sqrt{286}Y_{7,3}^{(c)}}{832} - \frac{3\sqrt{26}Y_{7,5}^{(c)}}{64} + \frac{9\sqrt{14}Y_{7,7}^{(c)}}{64} \tag{4061c}$$

$$\frac{3\sqrt{39}Y_{7,1}^{(s)}}{26} + \frac{\sqrt{13}Y_{7,3}^{(s)}}{52} - \frac{3\sqrt{143}Y_{7,5}^{(s)}}{52} \tag{4062a}$$

$$-\frac{\sqrt{26}Y_{7,2}^{(c)}}{13} + \frac{\sqrt{143}Y_{7,4}^{(c)}}{13} \tag{4062b}$$

$$-\frac{9\sqrt{39}Y_{7,1}^{(c)}}{208} - \frac{15\sqrt{13}Y_{7,3}^{(c)}}{208} + \frac{\sqrt{143}Y_{7,5}^{(c)}}{16} + \frac{\sqrt{77}Y_{7,7}^{(c)}}{16} \tag{4062c}$$

28.4.8 $T : l = 8$

$$-\frac{\sqrt{1155}Y_{8,1}^{(c)}}{64} + \frac{17Y_{8,3}^{(c)}}{64} + \frac{\sqrt{195}Y_{8,5}^{(c)}}{64} - \frac{3\sqrt{273}Y_{8,7}^{(c)}}{64} \tag{4063a}$$

$$-\frac{3\sqrt{66}Y_{8,2}^{(s)}}{64} - \frac{5\sqrt{15}Y_{8,4}^{(s)}}{32} - \frac{\sqrt{910}Y_{8,6}^{(s)}}{64} + \frac{\sqrt{273}Y_{8,8}^{(s)}}{32} \tag{4063b}$$

$$-Y_{8,3}^{(s)} \tag{4063c}$$

$$-\frac{\sqrt{1001}Y_{8,1}^{(c)}}{64} - \frac{\sqrt{195}Y_{8,3}^{(c)}}{64} + \frac{45Y_{8,5}^{(c)}}{64} + \frac{5\sqrt{35}Y_{8,7}^{(c)}}{64} \tag{4064a}$$

$$\frac{\sqrt{1430}Y_{8,2}^{(s)}}{64} + \frac{3\sqrt{13}Y_{8,4}^{(s)}}{32} - \frac{7\sqrt{42}Y_{8,6}^{(s)}}{64} + \frac{\sqrt{35}Y_{8,8}^{(s)}}{32} \tag{4064b}$$

$$-Y_{8,5}^{(s)} \tag{4064c}$$

$$-\frac{7\sqrt{136565}Y_{8,1}^{(c)}}{6112} + \frac{19\sqrt{52143}Y_{8,3}^{(c)}}{6112} - \frac{27\sqrt{6685}Y_{8,5}^{(c)}}{6112} + \frac{\sqrt{191}Y_{8,7}^{(c)}}{32} \tag{4065a}$$

$$\frac{3\sqrt{382382}Y_{8,2}^{(s)}}{6112} + \frac{\sqrt{86905}Y_{8,4}^{(s)}}{3056} + \frac{41\sqrt{5730}Y_{8,6}^{(s)}}{6112} + \frac{177\sqrt{191}Y_{8,8}^{(s)}}{3056} \tag{4065b}$$

$$-\frac{\sqrt{136565}Y_{8,1}^{(s)}}{382} + \frac{7\sqrt{191}Y_{8,7}^{(s)}}{382} \tag{4065c}$$

$$\frac{15\sqrt{191}Y_{8,1}^{(c)}}{382} + \frac{\sqrt{220605}Y_{8,3}^{(c)}}{764} + \frac{\sqrt{191191}Y_{8,5}^{(c)}}{764} \tag{4066a}$$

$$\frac{17\sqrt{13370}Y_{8,2}^{(s)}}{3056} - \frac{9\sqrt{14707}Y_{8,4}^{(s)}}{1528} + \frac{\sqrt{163878}Y_{8,6}^{(s)}}{3056} - \frac{\sqrt{136565}Y_{8,8}^{(s)}}{1528} \tag{4066b}$$

$$\frac{7\sqrt{191}Y_{8,1}^{(s)}}{382} + \frac{\sqrt{136565}Y_{8,7}^{(s)}}{382} \tag{4066c}$$

28.4.9 $T : l = 9$

$$-Y_{9,9}^{(s)} \tag{4067a}$$

$$\frac{\sqrt{24310}Y_{9,0}^{(c)}}{256} + \frac{3\sqrt{221}Y_{9,2}^{(c)}}{64} + \frac{3\sqrt{238}Y_{9,4}^{(c)}}{128} + \frac{\sqrt{51}Y_{9,6}^{(c)}}{64} + \frac{3\sqrt{2}Y_{9,8}^{(c)}}{256} \tag{4067b}$$

$$\frac{3\sqrt{4862}Y_{9,1}^{(c)}}{256} - \frac{\sqrt{4641}Y_{9,3}^{(c)}}{128} + \frac{3\sqrt{85}Y_{9,5}^{(c)}}{128} - \frac{3\sqrt{17}Y_{9,7}^{(c)}}{256} + \frac{Y_{9,9}^{(c)}}{256} \tag{4067c}$$

$$-\frac{7\sqrt{206130}Y_{9,1}^{(s)}}{6871} - \frac{2\sqrt{2645335}Y_{9,3}^{(s)}}{6871} - \frac{2\sqrt{2947659}Y_{9,5}^{(s)}}{6871} - \frac{\sqrt{14738295}Y_{9,7}^{(s)}}{6871} \tag{4068a}$$

$$\frac{\sqrt{41226}Y_{9,0}^{(c)}}{256} - \frac{221\sqrt{1133715}Y_{9,2}^{(c)}}{439744} - \frac{17\sqrt{206336130}Y_{9,4}^{(c)}}{879488} - \frac{17\sqrt{4912765}Y_{9,6}^{(c)}}{439744} - \frac{\sqrt{501102030}Y_{9,8}^{(c)}}{1758976} \tag{4068b}$$

$$-\frac{639\sqrt{206130}Y_{9,1}^{(c)}}{1758976} - \frac{35\sqrt{2645335}Y_{9,3}^{(c)}}{879488} + \frac{171\sqrt{2947659}Y_{9,5}^{(c)}}{879488} - \frac{239\sqrt{14738295}Y_{9,7}^{(c)}}{1758976} + \frac{85\sqrt{250551015}Y_{9,9}^{(c)}}{1758976} \tag{4068c}$$

$$\frac{42\sqrt{2026024286}Y_{9,1}^{(s)}}{7084001} + \frac{44\sqrt{1933932273}Y_{9,3}^{(s)}}{7084001} - \frac{3\sqrt{35420005}Y_{9,5}^{(s)}}{6871} + \frac{858\sqrt{7084001}Y_{9,7}^{(s)}}{7084001} \tag{4069a}$$

$$\frac{211\sqrt{92092013}Y_{9,2}^{(c)}}{113344016} - \frac{1665\sqrt{99176014}Y_{9,4}^{(c)}}{56672008} + \frac{18393\sqrt{21252003}Y_{9,6}^{(c)}}{113344016} + \frac{1087\sqrt{240856034}Y_{9,8}^{(c)}}{28336004} \tag{4069b}$$

$$\frac{2197\sqrt{2026024286}Y_{9,1}^{(c)}}{226688032} + \frac{907\sqrt{1933932273}Y_{9,3}^{(c)}}{56672008} - \frac{36\sqrt{35420005}Y_{9,5}^{(c)}}{7084001} - \frac{44795\sqrt{7084001}Y_{9,7}^{(c)}}{226688032} - \frac{3963\sqrt{120428017}Y_{9,9}^{(c)}}{226688032} \tag{4069c}$$

$$\frac{3\sqrt{44377333}Y_{9,1}^{(s)}}{44333} + \frac{11\sqrt{3457974}Y_{9,3}^{(s)}}{44333} - \frac{\sqrt{620662}Y_{9,7}^{(s)}}{1031} \tag{4070a}$$

$$\frac{59\sqrt{8068606}Y_{9,2}^{(c)}}{354664} - \frac{337\sqrt{44333}Y_{9,4}^{(c)}}{88666} - \frac{95\sqrt{1861986}Y_{9,6}^{(c)}}{354664} + \frac{\sqrt{5275627}Y_{9,8}^{(c)}}{44333} \tag{4070b}$$

$$-\frac{2\sqrt{44377333}Y_{9,1}^{(c)}}{44333} - \frac{31\sqrt{3457974}Y_{9,3}^{(c)}}{354664} + \frac{137\sqrt{3103310}Y_{9,5}^{(c)}}{354664} - \frac{133\sqrt{620662}Y_{9,7}^{(c)}}{354664} - \frac{63\sqrt{10551254}Y_{9,9}^{(c)}}{354664} \tag{4070c}$$

$$-\frac{\sqrt{946}Y_{9,1}^{(s)}}{43} + \frac{\sqrt{903}Y_{9,3}^{(s)}}{43} \tag{4071a}$$

$$-\frac{7\sqrt{43}Y_{9,2}^{(c)}}{688} + \frac{\sqrt{7826}Y_{9,4}^{(c)}}{344} - \frac{9\sqrt{1677}Y_{9,6}^{(c)}}{688} + \frac{\sqrt{19006}Y_{9,8}^{(c)}}{172} \tag{4071b}$$

$$\frac{7\sqrt{946}Y_{9,1}^{(c)}}{1376} + \frac{5\sqrt{903}Y_{9,3}^{(c)}}{344} + \frac{\sqrt{2795}Y_{9,5}^{(c)}}{86} + \frac{35\sqrt{559}Y_{9,7}^{(c)}}{1376} + \frac{3\sqrt{9503}Y_{9,9}^{(c)}}{1376} \tag{4071c}$$

28.4.10 $T : l = 10$

$$\frac{\sqrt{8398}Y_{10,1}^{(c)}}{256} + \frac{3\sqrt{969}Y_{10,3}^{(c)}}{128} + \frac{\sqrt{4845}Y_{10,5}^{(c)}}{128} + \frac{7\sqrt{57}Y_{10,7}^{(c)}}{256} + \frac{9Y_{10,9}^{(c)}}{256} \tag{4072a}$$

$$-\frac{\sqrt{5}Y_{10,10}^{(s)}}{256} - \frac{\sqrt{25194}Y_{10,2}^{(s)}}{256} + \frac{\sqrt{1938}Y_{10,4}^{(s)}}{64} - \frac{3\sqrt{969}Y_{10,6}^{(s)}}{256} + \frac{\sqrt{38}Y_{10,8}^{(s)}}{64} \tag{4072b}$$

$$-Y_{10,9}^{(s)} \tag{4072c}$$

$$\frac{7\sqrt{78}Y_{10,1}^{(c)}}{128} - \frac{21Y_{10,3}^{(c)}}{64} + \frac{\sqrt{5}Y_{10,5}^{(c)}}{64} + \frac{11\sqrt{17}Y_{10,7}^{(c)}}{128} - \frac{3\sqrt{969}Y_{10,9}^{(c)}}{128} \tag{4073a}$$

$$-\frac{\sqrt{4845}Y_{10,10}^{(s)}}{128} + \frac{7\sqrt{26}Y_{10,2}^{(s)}}{128} + \frac{11\sqrt{2}Y_{10,4}^{(s)}}{32} + \frac{69Y_{10,6}^{(s)}}{128} + \frac{\sqrt{102}Y_{10,8}^{(s)}}{32} \tag{4073b}$$

$$-Y_{10,3}^{(s)} \tag{4073c}$$

$$\frac{243\sqrt{711178}Y_{10,1}^{(c)}}{411904} - \frac{279\sqrt{82059}Y_{10,3}^{(c)}}{205952} + \frac{3\sqrt{410295}Y_{10,5}^{(c)}}{205952} + \frac{2181\sqrt{4827}Y_{10,7}^{(c)}}{411904} + \frac{\sqrt{30571}Y_{10,9}^{(c)}}{256} \tag{4074a}$$

$$-\frac{625\sqrt{152855}Y_{10,10}^{(s)}}{411904} - \frac{163\sqrt{2133534}Y_{10,2}^{(s)}}{411904} - \frac{133\sqrt{164118}Y_{10,4}^{(s)}}{102976} + \frac{87\sqrt{82059}Y_{10,6}^{(s)}}{411904} + \frac{347\sqrt{3218}Y_{10,8}^{(s)}}{102976} \tag{4074b}$$

$$-\frac{\sqrt{711178}Y_{10,1}^{(s)}}{1609} - \frac{2\sqrt{410295}Y_{10,5}^{(s)}}{1609} + \frac{7\sqrt{4827}Y_{10,7}^{(s)}}{1609} \tag{4074c}$$

$$\frac{843\sqrt{433107402}Y_{10,1}^{(c)}}{88842544} + \frac{5\sqrt{5552659}Y_{10,3}^{(c)}}{25744} - \frac{14061\sqrt{27763295}Y_{10,5}^{(c)}}{88842544} + \frac{1083\sqrt{326627}Y_{10,7}^{(c)}}{2613016} \tag{4075a}$$

$$\frac{335\sqrt{93088695}Y_{10,10}^{(s)}}{10452064} + \frac{1315\sqrt{144369134}Y_{10,2}^{(s)}}{177685088} - \frac{\sqrt{11105318}Y_{10,4}^{(s)}}{25744} - \frac{11955\sqrt{5552659}Y_{10,6}^{(s)}}{177685088} + \frac{17\sqrt{1959762}Y_{10,8}^{(s)}}{25744} \tag{4075b}$$

$$\frac{163\sqrt{433107402}Y_{10,1}^{(s)}}{5552659} - \frac{631\sqrt{27763295}Y_{10,5}^{(s)}}{5552659} - \frac{296\sqrt{326627}Y_{10,7}^{(s)}}{326627} \tag{4075c}$$

$$\frac{9\sqrt{51765}Y_{10,1}^{(c)}}{3451} - \frac{\sqrt{89726}Y_{10,5}^{(c)}}{3451} - \frac{\sqrt{26390}Y_{10,7}^{(c)}}{203} \tag{4076a}$$

$$-\frac{3\sqrt{300846}Y_{10,10}^{(s)}}{3248} + \frac{93\sqrt{17255}Y_{10,2}^{(s)}}{27608} - \frac{61\sqrt{448630}Y_{10,6}^{(s)}}{55216} \tag{4076b}$$

$$-\frac{9\sqrt{51765}Y_{10,1}^{(s)}}{3451} + \frac{\sqrt{89726}Y_{10,5}^{(s)}}{3451} - \frac{\sqrt{26390}Y_{10,7}^{(s)}}{203} \tag{4076c}$$

28.4.11 $T : l = 11$

$$\frac{\sqrt{22}Y_{11,11}^{(s)}}{1024} - \frac{\sqrt{29393}Y_{11,1}^{(s)}}{512} + \frac{9\sqrt{1615}Y_{11,3}^{(s)}}{512} - \frac{5\sqrt{13566}Y_{11,5}^{(s)}}{1024} + \frac{7\sqrt{1330}Y_{11,7}^{(s)}}{1024} - \frac{9\sqrt{42}Y_{11,9}^{(s)}}{1024} \tag{4077a}$$

$$Y_{11,10}^{(c)} \tag{4077b}$$

$$-\frac{\sqrt{22}Y_{11,11}^{(c)}}{1024} - \frac{\sqrt{29393}Y_{11,1}^{(c)}}{512} - \frac{9\sqrt{1615}Y_{11,3}^{(c)}}{512} - \frac{5\sqrt{13566}Y_{11,5}^{(c)}}{1024} - \frac{7\sqrt{1330}Y_{11,7}^{(c)}}{1024} - \frac{9\sqrt{42}Y_{11,9}^{(c)}}{1024} \tag{4077c}$$

$$-\frac{9\sqrt{241435194}Y_{11,11}^{(s)}}{535129088} + \frac{63\sqrt{38952831}Y_{11,1}^{(s)}}{20581888} - \frac{81\sqrt{17723538105}Y_{11,3}^{(s)}}{267564544} + \frac{945\sqrt{337591202}Y_{11,5}^{(s)}}{535129088} - \frac{441\sqrt{297874590}Y_{11,7}^{(s)}}{535129088} - \frac{\sqrt{1045174}Y_{11,9}^{(s)}}{1024} \tag{4078a}$$

$$-\frac{\sqrt{285654094}Y_{11,0}^{(c)}}{40199} - \frac{\sqrt{5063868030}Y_{11,2}^{(c)}}{522587} + \frac{6\sqrt{2363138414}Y_{11,4}^{(c)}}{522587} + \frac{\sqrt{29787459}Y_{11,6}^{(c)}}{8567} + \frac{3\sqrt{15677610}Y_{11,8}^{(c)}}{40199} \tag{4078b}$$

$$-\frac{503\sqrt{241435194}Y_{11,11}^{(c)}}{535129088} - \frac{1473\sqrt{38952831}Y_{11,1}^{(c)}}{20581888} - \frac{431\sqrt{17723538105}Y_{11,3}^{(c)}}{267564544} + \frac{20913\sqrt{337591202}Y_{11,5}^{(c)}}{535129088} - \frac{14407\sqrt{297874590}Y_{11,7}^{(c)}}{535129088} + \frac{79013\sqrt{1045174}Y_{11,9}^{(c)}}{535129088} \tag{4078c}$$

$$\frac{9\sqrt{4845323301517270}Y_{11,11}^{(s)}}{136372735759} - \frac{5814\sqrt{367157365505}Y_{11,1}^{(s)}}{10490210443} - \frac{\sqrt{136372735759}Y_{11,3}^{(s)}}{522587} - \frac{14535\sqrt{28638274509390}Y_{11,5}^{(s)}}{136372735759} + \frac{5985\sqrt{32456711110642}Y_{11,7}^{(s)}}{136372735759}$$ (4079a)

$$-\frac{62053\sqrt{24232386123330}Y_{11,0}^{(c)}}{671373468352} + \frac{471561\sqrt{1909218300626}Y_{11,2}^{(c)}}{1090981886072} - \frac{787235\sqrt{4091182072770}Y_{11,4}^{(c)}}{4363927544288} - \frac{103\sqrt{81141777776605}Y_{11,6}^{(c)}}{8942474476} + \frac{14619\sqrt{616677511102198}Y_{11,8}^{(c)}}{671373468352}$$ (4079b)

$$-\frac{393819\sqrt{4845323301517270}Y_{11,11}^{(c)}}{34911420354304} - \frac{293385\sqrt{367157365505}Y_{11,1}^{(c)}}{1342746936704} - \frac{9416093\sqrt{136372735759}Y_{11,3}^{(c)}}{17455710177152}$$
$$+ \frac{596587\sqrt{28638274509390}Y_{11,5}^{(c)}}{34911420354304} + \frac{2946549\sqrt{32456711110642}Y_{11,7}^{(c)}}{34911420354304} + \frac{106853\sqrt{9250162666532970}Y_{11,9}^{(c)}}{34911420354304}$$ (4079c)

$$-\frac{3677\sqrt{101640195011263370}Y_{11,11}^{(s)}}{69473817505990} + \frac{228084\sqrt{7676856834411895}Y_{11,1}^{(s)}}{34736908752995} - \frac{686279\sqrt{3543164692805490}Y_{11,5}^{(s)}}{69473817505990} - \frac{1059251\sqrt{13894763501198}Y_{11,7}^{(s)}}{6947381750599}$$ (4080a)

$$-\frac{737263\sqrt{506672551071185070}Y_{11,0}^{(c)}}{2223162160191680} - \frac{74113\sqrt{236210979520366}Y_{11,2}^{(c)}}{55579054004792} + \frac{4348849\sqrt{24802152849638430}Y_{11,4}^{(c)}}{1111581080095840} - \frac{3512157\sqrt{34736908752995}Y_{11,6}^{(c)}}{27789527002396} + \frac{2650377\sqrt{264000506522762}Y_{11,8}^{(c)}}{444632432038336}$$ (4080b)

$$\frac{6902089\sqrt{101640195011263370}Y_{11,11}^{(c)}}{8892648640766720} + \frac{4704453\sqrt{7676856834411895}Y_{11,1}^{(c)}}{4446324320383360} + \frac{1667043\sqrt{82673842832128{1}}Y_{11,3}^{(c)}}{889264846076672}$$
$$- \frac{26597343\sqrt{3543164692805490}Y_{11,5}^{(c)}}{8892648640766720} - \frac{43360285\sqrt{13894763501198}Y_{11,7}^{(c)}}{1778529728153344} + \frac{3960007597841430}{66804992}Y_{11,9}^{(c)}$$ (4080c)

$$-\frac{2117\sqrt{103767346291931251930}Y_{11,11}^{(s)}}{1123290678429185} - \frac{7\sqrt{160470096918455}Y_{11,1}^{(s)}}{133113535} + \frac{668117\sqrt{12516667559639490}Y_{11,5}^{(s)}}{1123290678429185} - \frac{1400717\sqrt{1418555656567591422}Y_{11,7}^{(s)}}{224658135685837}$$ (4081a)

$$-\frac{85006479\sqrt{10591026396618030}Y_{11,0}^{(c)}}{17972650854866960} + \frac{11800389\sqrt{834444503975966}Y_{11,2}^{(c)}}{898632542743348} + \frac{1425779\sqrt{87616672917476430}Y_{11,4}^{(c)}}{8986325427433480}$$
$$+ \frac{193449\sqrt{35463891418978555}Y_{11,6}^{(c)}}{449316271371674} - \frac{5409419\sqrt{269525574784237018}Y_{11,8}^{(c)}}{3594530170973392}$$ (4081b)

$$-\frac{1001117\sqrt{103767346291931251930}Y_{11,11}^{(c)}}{1797265085486960} + \frac{21347582\sqrt{160470096918455}Y_{11,1}^{(c)}}{1123290678429185} + \frac{10252797\sqrt{2920555763915881}Y_{11,3}^{(c)}}{1797265085486696}$$
$$- \frac{4981571\sqrt{12516667559639490}Y_{11,5}^{(c)}}{2567521550695280} - \frac{2607985\sqrt{1418555656567591422}Y_{11,7}^{(c)}}{449316271371674}$$ (4081c)

$$-\frac{59\sqrt{81769946790}Y_{11,11}^{(s)}}{16877182} + \frac{5\sqrt{132606430}Y_{11,5}^{(s)}}{16877182} + \frac{6\sqrt{1352585586}Y_{11,7}^{(s)}}{8438591}$$ (4082a)

$$-\frac{6135\sqrt{156716690}Y_{11,0}^{(c)}}{135017456} - \frac{2623\sqrt{79563858}Y_{11,2}^{(c)}}{33754364} - \frac{923\sqrt{928245010}Y_{11,4}^{(c)}}{67508728} - \frac{43\sqrt{3381463965}Y_{11,6}^{(c)}}{16877182} - \frac{19\sqrt{25699126134}Y_{11,8}^{(c)}}{135017456}$$ (4082b)

$$\frac{\sqrt{81769946790}Y_{11,11}^{(c)}}{135017456} + \frac{129\sqrt{2585825385}Y_{11,1}^{(c)}}{8438591} - \frac{2279\sqrt{278473503}Y_{11,3}^{(c)}}{67508728} + \frac{455\sqrt{132606430}Y_{11,5}^{(c)}}{19288208} - \frac{31\sqrt{1352585586}Y_{11,7}^{(c)}}{16877182}$$ (4082c)

28.4.12 $T : l = 12$

$$-\frac{7\sqrt{1771}Y_{12,11}^{(c)}}{1024} - \frac{5\sqrt{7106}Y_{12,1}^{(c)}}{1024} - \frac{\sqrt{13566}Y_{12,3}^{(c)}}{1024} + \frac{27\sqrt{399}Y_{12,5}^{(c)}}{1024} - \frac{161Y_{12,7}^{(c)}}{1024} - \frac{147\sqrt{21}Y_{12,9}^{(c)}}{1024}$$ (4083a)

$$-\frac{43\sqrt{154}Y_{12,10}^{(s)}}{1024} + \frac{\sqrt{10626}Y_{12,12}^{(s)}}{1024} - \frac{5\sqrt{2261}Y_{12,2}^{(s)}}{512} - \frac{3\sqrt{13566}Y_{12,4}^{(s)}}{1024} + \frac{29\sqrt{114}Y_{12,6}^{(s)}}{1024} + \frac{139Y_{12,8}^{(s)}}{256}$$ (4083b)

$$-Y_{12,7}^{(s)}$$ (4083c)

$$-\frac{1997\sqrt{9094085}Y_{12,11}^{(c)}}{15774720} + \frac{329\sqrt{36489310}Y_{12,1}^{(c)}}{15774720} + \frac{59\sqrt{69661410}Y_{12,3}^{(c)}}{1051648} + \frac{227\sqrt{2048865}Y_{12,5}^{(c)}}{5258240} - \frac{139\sqrt{5135}Y_{12,7}^{(c)}}{13312} + \frac{11311\sqrt{107835}Y_{12,9}^{(c)}}{15774720}$$ (4084a)

$$-\frac{5977\sqrt{790790}Y_{12,10}^{(s)}}{15774720} + \frac{139\sqrt{54564510}Y_{12,12}^{(s)}}{15774720} - \frac{139\sqrt{11610235}Y_{12,2}^{(s)}}{1577472} - \frac{139\sqrt{69661410}Y_{12,4}^{(s)}}{5258240} + \frac{4031\sqrt{585390}Y_{12,6}^{(s)}}{15774720} - \frac{3\sqrt{5135}Y_{12,8}^{(s)}}{256}$$ (4084b)

$$\frac{\sqrt{9094085}Y_{12,11}^{(s)}}{15405} + \frac{\sqrt{36489310}Y_{12,1}^{(s)}}{15405} - \frac{\sqrt{69661410}Y_{12,3}^{(s)}}{15405} - \frac{\sqrt{2048865}Y_{12,5}^{(s)}}{5135} + \frac{31\sqrt{107835}Y_{12,9}^{(s)}}{15405}$$ (4084c)

$$\frac{7\sqrt{101649620971470}Y_{12,11}^{(c)}}{423452640} - \frac{5491\sqrt{47889847005}Y_{12,1}^{(c)}}{9951137040} + \frac{\sqrt{207315355}Y_{12,3}^{(c)}}{16432} + \frac{2793\sqrt{7048722070}Y_{12,5}^{(c)}}{6634091360} + \frac{19\sqrt{2812440105930}Y_{12,7}^{(c)}}{83975840} - \frac{3829\sqrt{133925719330}Y_{12,9}^{(c)}}{6634091360}$$ (4085a)

$$\frac{2293\sqrt{2209774368945}Y_{12,10}^{(s)}}{9951137040} + \frac{31\sqrt{16941603495245}Y_{12,12}^{(s)}}{207315355} + \frac{19517\sqrt{1243892130}Y_{12,2}^{(s)}}{1990227408} - \frac{5391\sqrt{207315355}Y_{12,4}^{(s)}}{207315355} + \frac{10433\sqrt{24670527245}Y_{12,6}^{(s)}}{3317045680}$$ (4085b)

$$\frac{667\sqrt{101649620971470}Y_{12,11}^{(s)}}{9951137040} - \frac{8159\sqrt{47889847005}Y_{12,1}^{(s)}}{2487784260} - \frac{2419\sqrt{207315355}Y_{12,3}^{(s)}}{331704568} - \frac{1047\sqrt{7048722070}Y_{12,5}^{(s)}}{3317045680} + \frac{291\sqrt{133925719330}Y_{12,9}^{(s)}}{829261420}$$ (4085c)

$$\frac{35\sqrt{4124378408558530}Y_{12,11}^{(c)}}{28349247144} - \frac{2617043\sqrt{1943104647995}Y_{12,1}^{(c)}}{6662073078840} - \frac{94873\sqrt{311451916435770}Y_{12,5}^{(c)}}{2220691026280} - \frac{10123\sqrt{13807701628652470}Y_{12,7}^{(c)}}{4441382052560} - \frac{40129\sqrt{5917586412279630}Y_{12,9}^{(c)}}{13324146157680}$$ (4086a)

$$\frac{211261\sqrt{89660400186055}Y_{12,10}^{(s)}}{13324146157680} + \frac{6536\sqrt{6186567612837795}Y_{12,12}^{(s)}}{832759134855} - \frac{549521\sqrt{6106900322270}Y_{12,2}^{(s)}}{2664829231536} + \frac{52696\sqrt{9160350483405}Y_{12,4}^{(s)}}{277586378285} - \frac{32677\sqrt{1090081707525195}Y_{12,6}^{(s)}}{13324146157680}$$ (4086b)

$$-\frac{147191\sqrt{4124378408558530}Y_{12,11}^{(s)}}{13324146157680} - \frac{\sqrt{1943104647995}Y_{12,1}^{(s)}}{2422380} - \frac{524383\sqrt{9160350483405}Y_{12,3}^{(s)}}{6662073078840} - \frac{7897\sqrt{311451916435770}Y_{12,5}^{(s)}}{888276410512} + \frac{12563\sqrt{5917586412279630}Y_{12,9}^{(s)}}{3331036539420}$$ (4086c)

$$-\frac{20163\sqrt{1693357915209690}Y_{12,11}^{(c)}}{1291653634790} - \frac{31541\sqrt{230560173810015}Y_{12,1}^{(c)}}{1033322907832} - \frac{2427\sqrt{14208189982690}Y_{12,5}^{(c)}}{645826817395} + \frac{54199\sqrt{5669067803093310}Y_{12,7}^{(c)}}{10333229078320} + \frac{292553\sqrt{269955609671110}Y_{12,9}^{(c)}}{10333229078320}$$ (4087a)

$$-\frac{193559\sqrt{36812128591515}Y_{12,10}^{(s)}}{10333229078320} + \frac{23965\sqrt{282226319201615}Y_{12,12}^{(s)}}{1033322907832} + \frac{3119\sqrt{724617689117190}Y_{12,2}^{(s)}}{2066645815664} - \frac{218019\sqrt{120769614852865}Y_{12,4}^{(s)}}{5166614539160} - \frac{230495\sqrt{49728664939415}Y_{12,6}^{(s)}}{2066645815664}$$ (4087b)

$$-\frac{629\sqrt{1693357915209690}Y_{12,11}^{(s)}}{2583307269580} - \frac{\sqrt{120769614852865}Y_{12,3}^{(s)}}{13751090} + \frac{16953\sqrt{14208189982690}Y_{12,5}^{(s)}}{2583307269580} - \frac{21672\sqrt{269955609671110}Y_{12,9}^{(s)}}{645826817395}$$ (4087c)

$$-\frac{43\sqrt{6199446}Y_{12,11}^{(c)}}{187862} + \frac{\sqrt{161194895169}Y_{12,1}^{(c)}}{751448} - \frac{4\sqrt{82095694}Y_{12,5}^{(c)}}{93931} + \frac{33\sqrt{90737346}Y_{12,7}^{(c)}}{1502896} - \frac{321\sqrt{4320826}Y_{12,9}^{(c)}}{1502896}$$ (4088a)

$$\frac{121\sqrt{71293629}Y_{12,10}^{(s)}}{1502896} - \frac{201\sqrt{1033241}Y_{12,12}^{(s)}}{751448} - \frac{13\sqrt{4186880394}Y_{12,2}^{(s)}}{1502896} - \frac{11\sqrt{697813399}Y_{12,4}^{(s)}}{751448} - \frac{3\sqrt{287334929}Y_{12,6}^{(s)}}{1502896}$$ (4088b)

$$-\frac{3\sqrt{6199446}Y_{12,11}^{(s)}}{187862} + \frac{19\sqrt{82095694}Y_{12,5}^{(s)}}{187862} + \frac{18\sqrt{4320826}Y_{12,9}^{(s)}}{93931}$$ (4088c)

29 Group T_h

29.1 A_g

29.1.1 $A_g : l = 0$

$$Y_{0,0}^{(c)}$$
(4089a)

29.1.2 $A_g : l = 4$

$$\frac{\sqrt{21}Y_{4,0}^{(c)}}{6} + \frac{\sqrt{15}Y_{4,4}^{(c)}}{6}$$
(4090a)

29.1.3 $A_g : l = 6$

$$\frac{\sqrt{11}Y_{6,2}^{(c)}}{4} - \frac{\sqrt{5}Y_{6,6}^{(c)}}{4}$$
(4091a)

$$-\frac{\sqrt{2}Y_{6,0}^{(c)}}{4} + \frac{\sqrt{14}Y_{6,4}^{(c)}}{4}$$
(4092a)

29.1.4 $A_g : l = 8$

$$\frac{\sqrt{33}Y_{8,0}^{(c)}}{8} + \frac{\sqrt{21}Y_{8,4}^{(c)}}{12} + \frac{\sqrt{195}Y_{8,8}^{(c)}}{24}$$
(4093a)

29.1.5 $A_g : l = 10$

$$-\frac{\sqrt{85}Y_{10,10}^{(c)}}{16} + \frac{\sqrt{1482}Y_{10,2}^{(c)}}{48} + \frac{\sqrt{57}Y_{10,6}^{(c)}}{48}$$
(4094a)

$$\frac{\sqrt{390}Y_{10,0}^{(c)}}{48} - \frac{\sqrt{22}Y_{10,4}^{(c)}}{8} - \frac{\sqrt{1122}Y_{10,8}^{(c)}}{48}$$
(4095a)

29.1.6 $A_g : l = 12$

$$\frac{\sqrt{627}Y_{12,10}^{(c)}}{48} + \frac{\sqrt{102}Y_{12,2}^{(c)}}{48} - \frac{5\sqrt{7}Y_{12,6}^{(c)}}{16}$$
(4096a)

$$\frac{\sqrt{109467930}Y_{12,0}^{(c)}}{37920} + \frac{\sqrt{2098635}Y_{12,12}^{(c)}}{37920} - \frac{3\sqrt{2679285}Y_{12,4}^{(c)}}{12640} + \frac{\sqrt{790}Y_{12,8}^{(c)}}{32}$$
(4097a)

$$\frac{\sqrt{63595}Y_{12,0}^{(c)}}{395} + \frac{\sqrt{3317210}Y_{12,12}^{(c)}}{3160} + \frac{\sqrt{2598310}Y_{12,4}^{(c)}}{3160}$$
(4098a)

29.2 A_u

29.2.1 $A_u : l = 3$

$$-Y_{3,2}^{(s)}$$
(4099a)

29.2.2 $A_u : l = 7$

$$-\frac{\sqrt{78}Y_{7,2}^{(s)}}{12} - \frac{\sqrt{66}Y_{7,6}^{(s)}}{12}$$
(4100a)

29.2.3 $A_u : l = 9$

$$-\frac{\sqrt{102}Y_{9,4}^{(s)}}{12} + \frac{\sqrt{42}Y_{9,8}^{(s)}}{12}$$
(4101a)

$$\frac{\sqrt{3}Y_{9,2}^{(s)}}{4} - \frac{\sqrt{13}Y_{9,6}^{(s)}}{4}$$
(4102a)

29.2.4 $A_u : l = 11$

$$-\frac{\sqrt{798}Y_{11,10}^{(s)}}{48} - \frac{\sqrt{255}Y_{11,2}^{(s)}}{24} - \frac{3\sqrt{6}Y_{11,6}^{(s)}}{16}$$
(4103a)

29.3 E_u^1

29.3.1 $E_u^1 : l = 5$

$$\frac{\sqrt{2}iY_{5,2}^{(s)}}{2} - \frac{\sqrt{2}Y_{5,4}^{(s)}}{2}$$
(4104a)

29.3.2 $E_u^1 : l = 7$

$$-\frac{\sqrt{33}iY_{7,2}^{(s)}}{12} - \frac{\sqrt{2}Y_{7,4}^{(s)}}{2} + \frac{\sqrt{39}iY_{7,6}^{(s)}}{12}$$
(4105a)

29.3.3 $E_u^1 : l = 9$

$$\frac{\sqrt{26}iY_{9,2}^{(s)}}{8} - \frac{\sqrt{21}Y_{9,4}^{(s)}}{12} + \frac{\sqrt{6}iY_{9,6}^{(s)}}{8} - \frac{\sqrt{51}Y_{9,8}^{(s)}}{12}$$
(4106a)

29.3.4 $E_u^1 : l = 11$

$$\frac{\sqrt{105}iY_{11,10}^{(s)}}{96} - \frac{\sqrt{1938}iY_{11,2}^{(s)}}{96} + \frac{\sqrt{285}iY_{11,6}^{(s)}}{32} - \frac{\sqrt{2}Y_{11,8}^{(s)}}{2}$$

(4107a)

$$\frac{\sqrt{323}Y_{11,10}^{(s)}}{32} - \frac{\sqrt{70}Y_{11,2}^{(s)}}{32} + \frac{\sqrt{2}iY_{11,4}^{(s)}}{2} - \frac{\sqrt{119}Y_{11,6}^{(s)}}{32}$$

(4108a)

29.4 E_u^2

29.4.1 $E_u^2 : l = 5$

$$-\frac{\sqrt{2}iY_{5,2}^{(s)}}{2} - \frac{\sqrt{2}Y_{5,4}^{(s)}}{2}$$

(4109a)

29.4.2 $E_u^2 : l = 7$

$$-\frac{\sqrt{33}Y_{7,2}^{(s)}}{12} - \frac{\sqrt{2}iY_{7,4}^{(s)}}{2} + \frac{\sqrt{39}Y_{7,6}^{(s)}}{12}$$

(4110a)

29.4.3 $E_u^2 : l = 9$

$$-\frac{\sqrt{26}Y_{9,2}^{(s)}}{8} + \frac{\sqrt{21}iY_{9,4}^{(s)}}{12} - \frac{\sqrt{6}Y_{9,6}^{(s)}}{8} + \frac{\sqrt{51}iY_{9,8}^{(s)}}{12}$$

(4111a)

29.4.4 $E_u^2 : l = 11$

$$-\frac{\sqrt{753}Y_{11,10}^{(s)}}{48} + \frac{\sqrt{17025330}Y_{11,2}^{(s)}}{12048} + \frac{\sqrt{486438}iY_{11,4}^{(s)}}{1004} + \frac{3\sqrt{100149}Y_{11,6}^{(s)}}{4016} + \frac{\sqrt{17570}iY_{11,8}^{(s)}}{1004}$$

(4112a)

$$\frac{9\sqrt{502}iY_{11,2}^{(s)}}{502} + \frac{\sqrt{17570}Y_{11,4}^{(s)}}{1004} - \frac{\sqrt{21335}iY_{11,6}^{(s)}}{251} - \frac{\sqrt{486438}Y_{11,8}^{(s)}}{1004}$$

(4113a)

29.5 E_g^2

29.5.1 $E_g^2 : l = 2$

$$\frac{\sqrt{2}iY_{2,0}^{(c)}}{2} + \frac{\sqrt{2}Y_{2,2}^{(c)}}{2}$$

(4114a)

29.5.2 $E_g^2 : l = 4$

$$-\frac{\sqrt{30}iY_{4,0}^{(c)}}{12} + \frac{\sqrt{2}Y_{4,2}^{(c)}}{2} + \frac{\sqrt{42}iY_{4,4}^{(c)}}{12}$$

(4115a)

29.5.3 $E_g^2 : l = 6$

$$\frac{\sqrt{7}Y_{6,0}^{(c)}}{4} - \frac{\sqrt{10}iY_{6,2}^{(c)}}{8} + \frac{Y_{6,4}^{(c)}}{4} - \frac{\sqrt{22}iY_{6,6}^{(c)}}{8}$$

(4116a)

29.5.4 $E_g^2 : l = 8$

$$-\frac{\sqrt{105}iY_{8,0}^{(c)}}{32} + \frac{\sqrt{2}Y_{8,2}^{(c)}}{2} - \frac{\sqrt{165}iY_{8,4}^{(c)}}{48} + \frac{\sqrt{3003}Y_{8,8}^{(c)}}{96}$$

(4117a)

$$-\frac{\sqrt{143}iY_{8,0}^{(c)}}{32} + \frac{\sqrt{91}iY_{8,4}^{(c)}}{16} + \frac{\sqrt{2}Y_{8,6}^{(c)}}{2} + \frac{\sqrt{5}iY_{8,8}^{(c)}}{32}$$

(4118a)

29.5.5 $E_g^2 : l = 10$

$$\frac{3\sqrt{1606605}iY_{10,0}^{(c)}}{11984} + \frac{\sqrt{2419270}Y_{10,10}^{(c)}}{23968} - \frac{19\sqrt{29211}Y_{10,2}^{(c)}}{35952} - \frac{83\sqrt{749}iY_{10,4}^{(c)}}{5992} + \frac{\sqrt{4494}Y_{10,6}^{(c)}}{96} + \frac{31\sqrt{38199}iY_{10,8}^{(c)}}{11984}$$

(4119a)

$$\frac{11\sqrt{840378}Y_{10,0}^{(c)}}{17976} - \frac{\sqrt{185003}iY_{10,10}^{(c)}}{749} - \frac{\sqrt{381990}iY_{10,2}^{(c)}}{1498} + \frac{\sqrt{1655290}Y_{10,4}^{(c)}}{2996} - \frac{\sqrt{292110}Y_{10,8}^{(c)}}{17976}$$

(4120a)

29.5.6 $E_g^2 : l = 12$

$$-\frac{3\sqrt{1102101}iY_{12,0}^{(c)}}{11744} - \frac{\sqrt{7823706}Y_{12,10}^{(c)}}{35232} + \frac{\sqrt{179945238}iY_{12,12}^{(c)}}{23488} + \frac{\sqrt{1101}Y_{12,2}^{(c)}}{48} - \frac{155\sqrt{2202}iY_{12,4}^{(c)}}{23488} + \frac{5\sqrt{87346}Y_{12,6}^{(c)}}{11744} - \frac{\sqrt{829787}iY_{12,8}^{(c)}}{11744}$$

(4121a)

$$-\frac{5\sqrt{9246198}Y_{12,0}^{(c)}}{35232} - \frac{5\sqrt{7707}iY_{12,10}^{(c)}}{734} + \frac{7\sqrt{177261}Y_{12,12}^{(c)}}{35232} + \frac{\sqrt{27382971}Y_{12,4}^{(c)}}{11744} - \frac{\sqrt{76703}iY_{12,6}^{(c)}}{734} + \frac{43\sqrt{8074}Y_{12,8}^{(c)}}{11744}$$

(4122a)

29.6 E_g^1

29.6.1 $E_g^1 : l = 2$

$$-\frac{\sqrt{2}iY_{2,0}^{(c)}}{2} + \frac{\sqrt{2}Y_{2,2}^{(c)}}{2}$$

(4123a)

29.6.2 $E_g^1 : l = 4$

$$\frac{\sqrt{30}Y_{4,0}^{(c)}}{12} - \frac{\sqrt{2}iY_{4,2}^{(c)}}{2} - \frac{\sqrt{42}Y_{4,4}^{(c)}}{12}$$

(4124a)

29.6.3 $E_g^1 : l = 6$

$$-\frac{\sqrt{7}iY_{6,0}^{(c)}}{4} + \frac{\sqrt{10}Y_{6,2}^{(c)}}{8} - \frac{iY_{6,4}^{(c)}}{4} + \frac{\sqrt{22}Y_{6,6}^{(c)}}{8}$$

(4125a)

29.6.4 $E_g^1 : l = 8$

$$\frac{\sqrt{143}iY_{8,0}^{(c)}}{32} - \frac{\sqrt{91}iY_{8,4}^{(c)}}{16} + \frac{\sqrt{2}Y_{8,6}^{(c)}}{2} - \frac{\sqrt{5}iY_{8,8}^{(c)}}{32}$$

(4126a)

$$-\frac{\sqrt{105}Y_{8,0}^{(c)}}{32} + \frac{\sqrt{2}iY_{8,2}^{(c)}}{2} - \frac{\sqrt{165}Y_{8,4}^{(c)}}{48} + \frac{\sqrt{3003}Y_{8,8}^{(c)}}{96}$$

(4127a)

29.6.5 $E_g^1 : l = 10$

$$-\frac{3\sqrt{1606605}iY_{10,0}^{(c)}}{11984} + \frac{\sqrt{2419270}Y_{10,10}^{(c)}}{23968} - \frac{19\sqrt{29211}Y_{10,2}^{(c)}}{35952} + \frac{83\sqrt{749}iY_{10,4}^{(c)}}{5992} + \frac{\sqrt{4494}Y_{10,6}^{(c)}}{96} - \frac{31\sqrt{38199}iY_{10,8}^{(c)}}{11984}$$

(4128a)

$$-\frac{11\sqrt{840378}iY_{10,0}^{(c)}}{17976} + \frac{\sqrt{185003}Y_{10,10}^{(c)}}{749} + \frac{\sqrt{381990}Y_{10,2}^{(c)}}{1498} - \frac{\sqrt{1655290}iY_{10,4}^{(c)}}{2996} + \frac{\sqrt{292110}iY_{10,8}^{(c)}}{17976}$$

(4129a)

29.6.6 $E_g^1 : l = 12$

$$\frac{3\sqrt{1102101}iY_{12,0}^{(c)}}{11744} - \frac{\sqrt{7823706}Y_{12,10}^{(c)}}{35232} - \frac{\sqrt{179945238}iY_{12,12}^{(c)}}{23488} + \frac{\sqrt{1101}Y_{12,2}^{(c)}}{48} + \frac{155\sqrt{2202}Y_{12,4}^{(c)}}{23488} + \frac{5\sqrt{87346}Y_{12,6}^{(c)}}{11744} + \frac{\sqrt{829787}iY_{12,8}^{(c)}}{11744}$$

(4130a)

$$\frac{5\sqrt{9246198}Y_{12,0}^{(c)}}{35232} - \frac{5\sqrt{7707}iY_{12,10}^{(c)}}{734} - \frac{7\sqrt{177261}Y_{12,12}^{(c)}}{35232} - \frac{\sqrt{27382971}Y_{12,4}^{(c)}}{11744} - \frac{\sqrt{76703}iY_{12,6}^{(c)}}{734} - \frac{43\sqrt{8074}Y_{12,8}^{(c)}}{11744}$$

(4131a)

29.7 T_g

29.7.1 $T_g : l = 2$

$$-Y_{2,2}^{(s)}$$

(4132a)

$$-Y_{2,1}^{(s)}$$

(4132b)

$$Y_{2,1}^{(c)}$$

(4132c)

29.7.2 $T_g : l = 4$

$$-Y_{4,2}^{(s)}$$

(4133a)

$$\frac{\sqrt{2}Y_{4,1}^{(s)}}{4} - \frac{\sqrt{14}Y_{4,3}^{(s)}}{4}$$

(4133b)

$$-\frac{\sqrt{2}Y_{4,1}^{(c)}}{4} - \frac{\sqrt{14}Y_{4,3}^{(c)}}{4}$$

(4133c)

$$-Y_{4,4}^{(s)}$$

(4134a)

$$\frac{\sqrt{14}Y_{4,1}^{(s)}}{4} + \frac{\sqrt{2}Y_{4,3}^{(s)}}{4}$$

(4134b)

$$\frac{\sqrt{14}Y_{4,1}^{(c)}}{4} - \frac{\sqrt{2}Y_{4,3}^{(c)}}{4}$$

(4134c)

29.7.3 $T_g : l = 6$

$$-\frac{9Y_{6,2}^{(s)}}{16} + \frac{\sqrt{30}Y_{6,4}^{(s)}}{8} + \frac{\sqrt{55}Y_{6,6}^{(s)}}{16}$$

(4135a)

$$\frac{3\sqrt{10}Y_{6,1}^{(s)}}{16} + \frac{Y_{6,3}^{(s)}}{16} - \frac{\sqrt{165}Y_{6,5}^{(s)}}{16}$$

(4135b)

$$Y_{6,3}^{(c)}$$

(4135c)

$$-\frac{\sqrt{10}Y_{6,2}^{(s)}}{16} + \frac{\sqrt{3}Y_{6,4}^{(s)}}{4} - \frac{3\sqrt{22}Y_{6,6}^{(s)}}{16}$$

(4136a)

$$-\frac{5Y_{6,1}^{(s)}}{8} - \frac{3\sqrt{10}Y_{6,3}^{(s)}}{16} - \frac{\sqrt{66}Y_{6,5}^{(s)}}{16}$$

(4136b)

$$Y_{6,1}^{(c)}$$

(4136c)

$$-\frac{\sqrt{165}Y_{6,2}^{(s)}}{16} - \frac{\sqrt{22}Y_{6,4}^{(s)}}{8} - \frac{\sqrt{3}Y_{6,6}^{(s)}}{16}$$

(4137a)

$$-\frac{\sqrt{66}Y_{6,1}^{(s)}}{16} + \frac{\sqrt{165}Y_{6,3}^{(s)}}{16} - \frac{5Y_{6,5}^{(s)}}{16}$$

(4137b)

$$Y_{6,5}^{(c)}$$

(4137c)

29.7.4 $T_g : l = 8$

$$\frac{\sqrt{2002}Y_{8,2}^{(s)}}{64} + \frac{\sqrt{455}Y_{8,4}^{(s)}}{32} + \frac{3\sqrt{30}Y_{8,6}^{(s)}}{64} + \frac{Y_{8,8}^{(s)}}{32}$$

(4138a)

$$-\frac{\sqrt{715}Y_{8,1}^{(s)}}{64} + \frac{3\sqrt{273}Y_{8,3}^{(s)}}{64} - \frac{5\sqrt{35}Y_{8,5}^{(s)}}{64} + \frac{7Y_{8,7}^{(s)}}{64}$$

(4138b)

$$Y_{8,7}^{(c)}$$

(4138c)

$$-\frac{79\sqrt{4830}Y_{8,2}^{(s)}}{30912} - \frac{\sqrt{5313}Y_{8,4}^{(s)}}{15456} + \frac{7\sqrt{65778}Y_{8,6}^{(s)}}{1472} + \frac{3\sqrt{49335}Y_{8,8}^{(s)}}{736}$$

(4139a)

$$-\frac{7\sqrt{69}Y_{8,1}^{(s)}}{64} - \frac{39\sqrt{8855}Y_{8,3}^{(s)}}{10304} + \frac{25\sqrt{69069}Y_{8,5}^{(s)}}{30912} - \frac{\sqrt{49335}Y_{8,7}^{(s)}}{4416}$$

(4139b)

$$-\frac{5\sqrt{69}Y_{8,1}^{(c)}}{69} + \frac{\sqrt{8855}Y_{8,3}^{(c)}}{161} - \frac{\sqrt{69069}Y_{8,5}^{(c)}}{483}$$

(4139c)

$$\frac{71\sqrt{966}Y_{8,2}^{(s)}}{5152} - \frac{29\sqrt{26565}Y_{8,4}^{(s)}}{28336} - \frac{35\sqrt{32890}Y_{8,6}^{(s)}}{8096} + \frac{17\sqrt{9867}Y_{8,8}^{(s)}}{4048}$$

(4140a)

$$-\frac{2\sqrt{1771}Y_{8,3}^{(s)}}{161} - \frac{5\sqrt{345345}Y_{8,5}^{(s)}}{3542} + \frac{\sqrt{9867}Y_{8,7}^{(s)}}{506}$$

(4140b)

$$-\frac{3\sqrt{345}Y_{8,1}^{(c)}}{92} + \frac{37\sqrt{1771}Y_{8,3}^{(c)}}{14168} + \frac{19\sqrt{345345}Y_{8,5}^{(c)}}{14168}$$

(4140c)

$$\frac{\sqrt{2730}Y_{8,2}^{(s)}}{96} - \frac{7\sqrt{3003}Y_{8,4}^{(s)}}{528} + \frac{31\sqrt{22}Y_{8,6}^{(s)}}{352} - \frac{\sqrt{165}Y_{8,8}^{(s)}}{176} \tag{4141a}$$

$$\frac{\sqrt{231}Y_{8,5}^{(s)}}{66} + \frac{5\sqrt{165}Y_{8,7}^{(s)}}{66} \tag{4141b}$$

$$\frac{\sqrt{39}Y_{8,1}^{(c)}}{12} + \frac{\sqrt{5005}Y_{8,3}^{(c)}}{88} + \frac{5\sqrt{231}Y_{8,5}^{(c)}}{264} \tag{4141c}$$

29.7.5 $T_g : l = 10$

$$-\frac{\sqrt{41990}Y_{10,10}^{(s)}}{256} - \frac{7\sqrt{3}Y_{10,2}^{(s)}}{128} - \frac{\sqrt{39}Y_{10,4}^{(s)}}{32} - \frac{9\sqrt{78}Y_{10,6}^{(s)}}{256} - \frac{\sqrt{221}Y_{10,8}^{(s)}}{32} \tag{4142a}$$

$$-Y_{10,1}^{(s)} \tag{4142b}$$

$$\frac{63Y_{10,1}^{(c)}}{128} - \frac{7\sqrt{78}Y_{10,3}^{(c)}}{128} + \frac{3\sqrt{390}Y_{10,5}^{(c)}}{128} - \frac{3\sqrt{1326}Y_{10,7}^{(c)}}{256} + \frac{\sqrt{8398}Y_{10,9}^{(c)}}{256} \tag{4142c}$$

$$\frac{13\sqrt{381786}Y_{10,10}^{(s)}}{50432} + \frac{21\sqrt{12805}Y_{10,2}^{(s)}}{126080} - \frac{\sqrt{985}Y_{10,4}^{(s)}}{32} + \frac{351\sqrt{1970}Y_{10,6}^{(s)}}{252160} + \frac{13\sqrt{50235}Y_{10,8}^{(s)}}{31520} \tag{4143a}$$

$$\frac{11\sqrt{1970}Y_{10,3}^{(s)}}{985} - \frac{5\sqrt{394}Y_{10,5}^{(s)}}{197} + \frac{\sqrt{33490}Y_{10,7}^{(s)}}{1970} + \frac{\sqrt{1908930}Y_{10,9}^{(s)}}{1970} \tag{4143b}$$

$$-\frac{191\sqrt{38415}Y_{10,1}^{(c)}}{126080} - \frac{227\sqrt{1970}Y_{10,3}^{(c)}}{25216} - \frac{757\sqrt{394}Y_{10,5}^{(c)}}{25216} - \frac{11\sqrt{33490}Y_{10,7}^{(c)}}{252160} + \frac{23\sqrt{1908930}Y_{10,9}^{(c)}}{50432} \tag{4143c}$$

$$\frac{117\sqrt{10827832746}Y_{10,10}^{(s)}}{44696936} + \frac{189\sqrt{363162605}Y_{10,2}^{(s)}}{111742340} - \frac{\sqrt{55871170}Y_{10,6}^{(s)}}{7880} + \frac{117\sqrt{1424714835}Y_{10,8}^{(s)}}{27935585} \tag{4144a}$$

$$\frac{35913\sqrt{55871170}Y_{10,3}^{(s)}}{446969360} - \frac{385\sqrt{11174234}Y_{10,5}^{(s)}}{89393872} - \frac{10501\sqrt{949809890}Y_{10,7}^{(s)}}{446969360} - \frac{651\sqrt{54139163730}Y_{10,9}^{(s)}}{446969360} \tag{4144b}$$

$$\frac{1989\sqrt{1089487815}Y_{10,1}^{(c)}}{446969360} + \frac{1047\sqrt{55871170}Y_{10,3}^{(c)}}{11174234} - \frac{2791\sqrt{11174234}Y_{10,5}^{(c)}}{44696936} - \frac{17141\sqrt{949809890}Y_{10,7}^{(c)}}{893938720} + \frac{3\sqrt{54139163730}Y_{10,9}^{(c)}}{2263136} \tag{4144c}$$

$$\frac{884\sqrt{114717692510}Y_{10,10}^{(s)}}{603777329} + \frac{56\sqrt{400304369127}Y_{10,2}^{(s)}}{603777329} - \frac{\sqrt{603777329}Y_{10,8}^{(s)}}{28361} \tag{4145a}$$

$$\frac{20505\sqrt{61585287558}Y_{10,3}^{(s)}}{9660437264} + \frac{13199\sqrt{307926437790}Y_{10,5}^{(s)}}{9660437264} + \frac{58379\sqrt{3622663974}Y_{10,7}^{(s)}}{9660437264} + \frac{7919\sqrt{22943538502}Y_{10,9}^{(s)}}{9660437264} \tag{4145b}$$

$$-\frac{\sqrt{133434789709}Y_{10,1}^{(c)}}{453776} - \frac{49\sqrt{61585287558}Y_{10,3}^{(c)}}{603777329} + \frac{4045\sqrt{307926437790}Y_{10,5}^{(c)}}{4830218632} - \frac{117421\sqrt{3622663974}Y_{10,7}^{(c)}}{19320874528} + \frac{69\sqrt{22943538502}Y_{10,9}^{(c)}}{244568032} \tag{4145c}$$

$$\frac{7\sqrt{127734}Y_{10,10}^{(s)}}{21289} - \frac{\sqrt{446962555}Y_{10,2}^{(s)}}{21289} \tag{4146a}$$

$$\frac{7\sqrt{68763470}Y_{10,3}^{(s)}}{170312} - \frac{19\sqrt{13752694}Y_{10,5}^{(s)}}{170312} + \frac{49\sqrt{4044910}Y_{10,7}^{(s)}}{170312} - \frac{131\sqrt{638670}Y_{10,9}^{(s)}}{170312} \tag{4146b}$$

$$\frac{7\sqrt{68763470}Y_{10,3}^{(c)}}{170312} + \frac{19\sqrt{13752694}Y_{10,5}^{(c)}}{170312} + \frac{49\sqrt{4044910}Y_{10,7}^{(c)}}{170312} + \frac{131\sqrt{638670}Y_{10,9}^{(c)}}{170312} \tag{4146c}$$

29.7.6 $T_g : l = 12$

$$-\frac{19\sqrt{1254}Y_{12,10}^{(s)}}{1024} - \frac{3\sqrt{9614}Y_{12,12}^{(s)}}{1024} + \frac{25\sqrt{51}Y_{12,2}^{(s)}}{512} - \frac{85\sqrt{34}Y_{12,4}^{(s)}}{1024} + \frac{75\sqrt{14}Y_{12,6}^{(s)}}{1024} + \frac{3\sqrt{399}Y_{12,8}^{(s)}}{256} \tag{4147a}$$

$$\frac{5\sqrt{14421}Y_{12,11}^{(s)}}{1024} + \frac{5\sqrt{7854}Y_{12,1}^{(s)}}{1024} + \frac{27\sqrt{34}Y_{12,3}^{(s)}}{1024} - \frac{263Y_{12,5}^{(s)}}{1024} - \frac{27\sqrt{399}Y_{12,7}^{(s)}}{1024} - \frac{75\sqrt{19}Y_{12,9}^{(s)}}{1024} \tag{4147b}$$

$$Y_{12,5}^{(c)} \tag{4147c}$$

$$\frac{1475\sqrt{62152266}Y_{12,10}^{(s)}}{964301824} + \frac{5299\sqrt{476500706}Y_{12,12}^{(s)}}{964301824} + \frac{7341\sqrt{912508269}Y_{12,2}^{(s)}}{482150912} + \frac{3303\sqrt{608338846}Y_{12,4}^{(s)}}{964301824} - \frac{43513\sqrt{250492466}Y_{12,6}^{(s)}}{964301824} + \frac{27469\sqrt{19775721}Y_{12,8}^{(s)}}{241075456} \tag{4148a}$$

$$-\frac{7125\sqrt{714751059}Y_{12,11}^{(s)}}{964301824} - \frac{375\sqrt{140526273426}Y_{12,1}^{(s)}}{964301824} - \frac{2025\sqrt{608338846}Y_{12,3}^{(s)}}{964301824} + \frac{19725\sqrt{17892319}Y_{12,5}^{(s)}}{964301824} + \frac{38475\sqrt{19775721}Y_{12,7}^{(s)}}{964301824} - \frac{\sqrt{941701}Y_{12,9}^{(s)}}{1024} \tag{4148b}$$

$$\frac{3\sqrt{714751059}Y_{12,11}^{(c)}}{941701} - \frac{\sqrt{1405262734261}Y_{12,1}^{(c)}}{941701} - \frac{17\sqrt{6083338846}Y_{12,3}^{(c)}}{941701} + \frac{147\sqrt{19775721}Y_{12,7}^{(c)}}{941701} + \frac{381\sqrt{941701}Y_{12,9}^{(c)}}{941701} \tag{4148c}$$

$$-\frac{\sqrt{128977880476567}Y_{12,10}^{(s)}}{15067216} + \frac{1379939\sqrt{8899473752883123}Y_{12,12}^{(s)}}{515911521906268} - \frac{639375\sqrt{916516818666485102}Y_{12,2}^{(s)}}{2063646087625072} + \frac{186245\sqrt{1374775227999727653}Y_{12,4}^{(s)}}{515911521906268}$$
$$-\frac{686575\sqrt{566083917411652563}Y_{12,6}^{(s)}}{2063646087625072} - \frac{358647\sqrt{19862593593391318}Y_{12,8}^{(s)}}{257955760953134} \tag{4149a}$$

$$-\frac{14956235\sqrt{5932982501922082}Y_{12,11}^{(s)}}{2063646087625072} + \frac{225955\sqrt{291618987757517987}Y_{12,1}^{(s)}}{515911521906268} - \frac{354097\sqrt{1374775227999727653}Y_{12,3}^{(s)}}{1031823043812536}$$
$$-\frac{3317129\sqrt{161738262117615018}Y_{12,5}^{(s)}}{2063646087625072} - \frac{839749\sqrt{19862593593391318}Y_{12,7}^{(s)}}{515911521906268} \tag{4149b}$$

$$-\frac{285155\sqrt{5932982501922082}Y_{12,11}^{(c)}}{515911521906268} - \frac{1189295\sqrt{291618987757517987}Y_{12,1}^{(c)}}{1031823043812536} - \frac{120847\sqrt{1374775227999727653}Y_{12,3}^{(c)}}{515911521906268}$$
$$-\frac{9960667\sqrt{19862593593391318}Y_{12,7}^{(c)}}{2063646087625072} + \frac{6026125\sqrt{8512540111453422}Y_{12,9}^{(c)}}{2063646087625072} \tag{4149c}$$

$$-\frac{9507613\sqrt{2073228516452658864453}Y_{12,12}^{(s)}}{6243488850600892496} + \frac{4295178\sqrt{17645660364010772416821}Y_{12,2}^{(s)}}{390218053162555781} - \frac{23094057\sqrt{26468490546016158625231}Y_{12,4}^{(s)}}{6243488850600892496}$$
$$-\frac{25519676\sqrt{2224242903020265679517}Y_{12,6}^{(s)}}{390218053162555781} - \frac{\sqrt{78043610632511156281}Y_{12,8}^{(s)}}{1095701336} \tag{4150a}$$

$$\frac{64765963\sqrt{13821523443017725763021}Y_{12,11}^{(s)}}{6243488850600892496} + \frac{16136759\sqrt{138644474288656060689893}Y_{12,1}^{(s)}}{1560872212650223124} - \frac{27573565\sqrt{26468490546016158625231}Y_{12,3}^{(s)}}{3121744425300446248}$$
$$-\frac{54278925\sqrt{311394006423719513238}Y_{12,5}^{(s)}}{6243488850600892496} + \frac{1215215245\sqrt{780436106325111562}Y_{12,7}^{(s)}}{1560872212650223124} \tag{4150b}$$

$$-\frac{5878495\sqrt{13821523443017725763021}Y_{12,11}^{(c)}}{1560872212650223124} - \frac{25948591\sqrt{138644474288656060689893}Y_{12,1}^{(c)}}{3121744425300446248} + \frac{10655743\sqrt{26468490546016158625231}Y_{12,3}^{(c)}}{1560872212650223124}$$
$$-\frac{507798511\sqrt{780436106325111562}Y_{12,7}^{(c)}}{6243488850600892496} + \frac{1341015535\sqrt{16389158232827342802}Y_{12,9}^{(c)}}{6243488850600892496} \tag{4150c}$$

$$-\frac{41177685\sqrt{30545203382962696983}Y_{12,12}^{(s)}}{252179181696286456} - \frac{8038493\sqrt{15950333242290118342}Y_{12,2}^{(s)}}{126089590848143228} + \frac{9587257\sqrt{23925499863435177513}Y_{12,4}^{(s)}}{252179181696286456} - \frac{346839\sqrt{284713448374878612404]}7Y_{12,6}^{(s)}}{63044795424071614} \tag{4151a}$$

$$-\frac{\sqrt{20363468921975131322}Y_{12,11}^{(s)}}{11396333372} + \frac{42257709\sqrt{5075106031637764927}Y_{12,1}^{(s)}}{126089590848143228} + \frac{9749325\sqrt{23925499863435177513}Y_{12,3}^{(s)}}{126089590848143228}$$
$$+ \frac{374075\sqrt{813466995356796035442}Y_{12,5}^{(s)}}{31522397712035807} + \frac{82885\sqrt{360637034608179575712 62}Y_{12,7}^{(s)}}{126089590848143228} \tag{4151b}$$

$$-\frac{4078507\sqrt{20363468921975131322}Y_{12,11}^{(c)}}{126089590848143228} + \frac{65169267\sqrt{5075106031637764927}Y_{12,1}^{(c)}}{252179181696286456} - \frac{19991751\sqrt{23925499863435177513}Y_{12,3}^{(c)}}{126089590848143228}$$
$$- \frac{488063\sqrt{360637034608179575712 62}Y_{12,7}^{(c)}}{504358363392572912} + \frac{273201\sqrt{154558729117791246733989}Y_{12,9}^{(c)}}{504358363392572912} \tag{4151c}$$

$$\frac{5\sqrt{6329001141617}Y_{12,12}^{(s)}}{88512392} - \frac{1125\sqrt{464690058}Y_{12,2}^{(s)}}{44256196} - \frac{7173\sqrt{77448343}Y_{12,4}^{(s)}}{88512392} - \frac{667\sqrt{188088833}Y_{12,6}^{(s)}}{22128098} \tag{4152a}$$

$$\frac{305\sqrt{365113617}Y_{12,1}^{(s)}}{44256196} - \frac{3419\sqrt{77448343}Y_{12,3}^{(s)}}{44256196} + \frac{525\sqrt{2633243662}Y_{12,5}^{(s)}}{44256196} - \frac{117\sqrt{21442126962}Y_{12,7}^{(s)}}{44256196} \tag{4152b}$$

$$-\frac{7\sqrt{37974006849702}Y_{12,11}^{(c)}}{44256196} - \frac{645\sqrt{365113617}Y_{12,1}^{(c)}}{88512392} + \frac{195\sqrt{77448343}Y_{12,3}^{(c)}}{44256196} + \frac{155\sqrt{21442126962}Y_{12,7}^{(c)}}{177024784} - \frac{89\sqrt{50031629578}Y_{12,9}^{(c)}}{177024784} \tag{4152c}$$

29.8 T_u

29.8.1 $T_u : l = 1$

$$-Y_{1,1}^{(s)} \tag{4153a}$$

$$Y_{1,0}^{(c)} \tag{4153b}$$

$$Y_{1,1}^{(c)} \tag{4153c}$$

29.8.2 $T_u : l = 3$

$$\frac{\sqrt{6}Y_{3,1}^{(s)}}{4} + \frac{\sqrt{10}Y_{3,3}^{(s)}}{4} \tag{4154a}$$

$$Y_{3,0}^{(c)} \tag{4154b}$$

$$-\frac{\sqrt{6}Y_{3,1}^{(c)}}{4} + \frac{\sqrt{10}Y_{3,3}^{(c)}}{4} \tag{4154c}$$

$$-\frac{\sqrt{10}Y_{3,1}^{(s)}}{4} + \frac{\sqrt{6}Y_{3,3}^{(s)}}{4} \tag{4155a}$$

$$Y_{3,2}^{(c)} \tag{4155b}$$

$$-\frac{\sqrt{10}Y_{3,1}^{(c)}}{4} - \frac{\sqrt{6}Y_{3,3}^{(c)}}{4} \tag{4155c}$$

29.8.3 $T_u : l = 5$

$$-\frac{\sqrt{21}Y_{5,1}^{(s)}}{8} + \frac{9\sqrt{2}Y_{5,3}^{(s)}}{16} - \frac{\sqrt{10}Y_{5,5}^{(s)}}{16} \tag{4156a}$$

$$Y_{5,4}^{(c)} \tag{4156b}$$

$$\frac{\sqrt{21}Y_{5,1}^{(c)}}{8} + \frac{9\sqrt{2}Y_{5,3}^{(c)}}{16} + \frac{\sqrt{10}Y_{5,5}^{(c)}}{16} \tag{4156c}$$

$$-\frac{\sqrt{15}Y_{5,1}^{(s)}}{8} - \frac{\sqrt{70}Y_{5,3}^{(s)}}{16} - \frac{3\sqrt{14}Y_{5,5}^{(s)}}{16} \tag{4157a}$$

$$Y_{5,0}^{(c)} \tag{4157b}$$

$$\frac{\sqrt{15}Y_{5,1}^{(c)}}{8} - \frac{\sqrt{70}Y_{5,3}^{(c)}}{16} + \frac{3\sqrt{14}Y_{5,5}^{(c)}}{16} \tag{4157c}$$

$$\frac{\sqrt{7}Y_{5,1}^{(s)}}{4} + \frac{\sqrt{6}Y_{5,3}^{(s)}}{8} - \frac{\sqrt{30}Y_{5,5}^{(s)}}{8} \tag{4158a}$$

$$Y_{5,2}^{(c)} \tag{4158b}$$

$$\frac{\sqrt{7}Y_{5,1}^{(c)}}{4} - \frac{\sqrt{6}Y_{5,3}^{(c)}}{8} - \frac{\sqrt{30}Y_{5,5}^{(c)}}{8} \tag{4158c}$$

29.8.4 $T_u : l = 7$

$$\frac{5\sqrt{7}Y_{7,1}^{(s)}}{32} + \frac{3\sqrt{21}Y_{7,3}^{(s)}}{32} + \frac{\sqrt{231}Y_{7,5}^{(s)}}{32} + \frac{\sqrt{429}Y_{7,7}^{(s)}}{32} \tag{4159a}$$

$$Y_{7,0}^{(c)} \tag{4159b}$$

$$-\frac{5\sqrt{7}Y_{7,1}^{(c)}}{32} + \frac{3\sqrt{21}Y_{7,3}^{(c)}}{32} - \frac{\sqrt{231}Y_{7,5}^{(c)}}{32} + \frac{\sqrt{429}Y_{7,7}^{(c)}}{32} \tag{4159c}$$

$$-\frac{\sqrt{858}Y_{7,1}^{(s)}}{64} + \frac{3\sqrt{286}Y_{7,3}^{(s)}}{64} - \frac{5\sqrt{26}Y_{7,5}^{(s)}}{64} + \frac{\sqrt{14}Y_{7,7}^{(s)}}{64} \tag{4160a}$$

$$Y_{7,6}^{(c)} \tag{4160b}$$

$$-\frac{\sqrt{858}Y_{7,1}^{(c)}}{64} - \frac{3\sqrt{286}Y_{7,3}^{(c)}}{64} - \frac{5\sqrt{26}Y_{7,5}^{(c)}}{64} - \frac{\sqrt{14}Y_{7,7}^{(c)}}{64} \tag{4160c}$$

$$\frac{9\sqrt{858}Y_{7,1}^{(s)}}{832} + \frac{21\sqrt{286}Y_{7,3}^{(s)}}{832} + \frac{61\sqrt{26}Y_{7,5}^{(s)}}{832} - \frac{13\sqrt{14}Y_{7,7}^{(s)}}{64} \tag{4161a}$$

$$-\frac{\sqrt{143}Y_{7,2}^{(c)}}{13} - \frac{\sqrt{26}Y_{7,4}^{(c)}}{13} \tag{4161b}$$

$$\frac{21\sqrt{858}Y_{7,1}^{(c)}}{832} - \frac{17\sqrt{286}Y_{7,3}^{(c)}}{832} - \frac{3\sqrt{26}Y_{7,5}^{(c)}}{64} + \frac{9\sqrt{14}Y_{7,7}^{(c)}}{64} \tag{4161c}$$

$$\frac{3\sqrt{39}Y_{7,1}^{(s)}}{26} + \frac{\sqrt{13}Y_{7,3}^{(s)}}{52} - \frac{3\sqrt{143}Y_{7,5}^{(s)}}{52} \tag{4162a}$$

$$-\frac{\sqrt{26}Y_{7,2}^{(c)}}{13} + \frac{\sqrt{143}Y_{7,4}^{(c)}}{13} \tag{4162b}$$

$$-\frac{9\sqrt{39}Y_{7,1}^{(c)}}{208} - \frac{15\sqrt{13}Y_{7,3}^{(c)}}{208} + \frac{\sqrt{143}Y_{7,5}^{(c)}}{16} + \frac{\sqrt{77}Y_{7,7}^{(c)}}{16} \tag{4162c}$$

29.8.5 $T_u : l = 9$

$$-Y_{9,9}^{(s)} \tag{4163a}$$

$$\frac{\sqrt{24310}Y_{9,0}^{(c)}}{256} + \frac{3\sqrt{221}Y_{9,2}^{(c)}}{64} + \frac{3\sqrt{238}Y_{9,4}^{(c)}}{128} + \frac{\sqrt{51}Y_{9,6}^{(c)}}{64} + \frac{3\sqrt{2}Y_{9,8}^{(c)}}{256} \tag{4163b}$$

$$\frac{3\sqrt{4862}Y_{9,1}^{(c)}}{256} - \frac{\sqrt{4641}Y_{9,3}^{(c)}}{128} + \frac{3\sqrt{85}Y_{9,5}^{(c)}}{128} - \frac{3\sqrt{17}Y_{9,7}^{(c)}}{256} + \frac{Y_{9,9}^{(c)}}{256} \tag{4163c}$$

$$-\frac{7\sqrt{206130}Y_{9,1}^{(s)}}{6871} - \frac{2\sqrt{2645335}Y_{9,3}^{(s)}}{6871} - \frac{2\sqrt{2947659}Y_{9,5}^{(s)}}{6871} - \frac{\sqrt{14738295}Y_{9,7}^{(s)}}{6871} \tag{4164a}$$

$$\frac{\sqrt{41226}Y_{9,0}^{(c)}}{256} - \frac{221\sqrt{1133715}Y_{9,2}^{(c)}}{439744} - \frac{17\sqrt{206336130}Y_{9,4}^{(c)}}{879488} - \frac{17\sqrt{4912765}Y_{9,6}^{(c)}}{439744} - \frac{\sqrt{501102030}Y_{9,8}^{(c)}}{1758976} \tag{4164b}$$

$$-\frac{639\sqrt{206130}Y_{9,1}^{(c)}}{1758976} - \frac{35\sqrt{2645335}Y_{9,3}^{(c)}}{879488} + \frac{171\sqrt{2947659}Y_{9,5}^{(c)}}{879488} - \frac{239\sqrt{14738295}Y_{9,7}^{(c)}}{1758976} + \frac{85\sqrt{250551015}Y_{9,9}^{(c)}}{1758976} \tag{4164c}$$

$$\frac{42\sqrt{2026024286}Y_{9,1}^{(s)}}{7084001} + \frac{44\sqrt{1933932273}Y_{9,3}^{(s)}}{7084001} - \frac{\sqrt{35420005}Y_{9,5}^{(s)}}{6871} + \frac{858\sqrt{7084001}Y_{9,7}^{(s)}}{7084001} \tag{4165a}$$

$$\frac{211\sqrt{92092013}Y_{9,2}^{(c)}}{113344016} - \frac{1665\sqrt{99176014}Y_{9,4}^{(c)}}{56672008} + \frac{18393\sqrt{21252003}Y_{9,6}^{(c)}}{113344016} + \frac{1087\sqrt{240856034}Y_{9,8}^{(c)}}{28336004} \tag{4165b}$$

$$\frac{2197\sqrt{2026024286}Y_{9,1}^{(c)}}{226688032} + \frac{907\sqrt{1933932273}Y_{9,3}^{(c)}}{56672008} - \frac{36\sqrt{35420005}Y_{9,5}^{(c)}}{7084001} - \frac{44795\sqrt{7084001}Y_{9,7}^{(c)}}{226688032} - \frac{3963\sqrt{120428017}Y_{9,9}^{(c)}}{226688032} \tag{4165c}$$

$$\frac{3\sqrt{44377333}Y_{9,1}^{(s)}}{44333} + \frac{11\sqrt{3457974}Y_{9,3}^{(s)}}{44333} - \frac{\sqrt{620662}Y_{9,7}^{(s)}}{1031} \tag{4166a}$$

$$\frac{59\sqrt{8068606}Y_{9,2}^{(c)}}{354664} - \frac{337\sqrt{44333}Y_{9,4}^{(c)}}{88666} - \frac{95\sqrt{1861986}Y_{9,6}^{(c)}}{354664} + \frac{\sqrt{5275627}Y_{9,8}^{(c)}}{44333} \tag{4166b}$$

$$-\frac{2\sqrt{44377333}Y_{9,1}^{(c)}}{44333} - \frac{31\sqrt{3457974}Y_{9,3}^{(c)}}{354664} + \frac{137\sqrt{3103310}Y_{9,5}^{(c)}}{354664} - \frac{133\sqrt{620662}Y_{9,7}^{(c)}}{354664} - \frac{63\sqrt{10551254}Y_{9,9}^{(c)}}{354664} \tag{4166c}$$

$$-\frac{\sqrt{946}Y_{9,1}^{(s)}}{43} + \frac{\sqrt{903}Y_{9,3}^{(s)}}{43} \tag{4167a}$$

$$-\frac{7\sqrt{43}Y_{9,2}^{(c)}}{688} + \frac{\sqrt{7826}Y_{9,4}^{(c)}}{344} - \frac{9\sqrt{1677}Y_{9,6}^{(c)}}{688} + \frac{\sqrt{19006}Y_{9,8}^{(c)}}{172} \tag{4167b}$$

$$\frac{7\sqrt{946}Y_{9,1}^{(c)}}{1376} + \frac{5\sqrt{903}Y_{9,3}^{(c)}}{344} + \frac{\sqrt{2795}Y_{9,5}^{(c)}}{86} + \frac{35\sqrt{559}Y_{9,7}^{(c)}}{1376} + \frac{3\sqrt{9503}Y_{9,9}^{(c)}}{1376} \tag{4167c}$$

29.8.6 $T_u : l = 11$

$$\frac{\sqrt{22}Y_{11,11}^{(s)}}{1024} - \frac{\sqrt{29393}Y_{11,1}^{(s)}}{512} + \frac{9\sqrt{1615}Y_{11,3}^{(s)}}{512} - \frac{5\sqrt{13566}Y_{11,5}^{(s)}}{1024} + \frac{7\sqrt{1330}Y_{11,7}^{(s)}}{1024} - \frac{9\sqrt{42}Y_{11,9}^{(s)}}{1024} \tag{4168a}$$

$$Y_{11,10}^{(c)} \tag{4168b}$$

$$-\frac{\sqrt{22}Y_{11,11}^{(c)}}{1024} - \frac{\sqrt{29393}Y_{11,1}^{(c)}}{512} - \frac{9\sqrt{1615}Y_{11,3}^{(c)}}{512} - \frac{5\sqrt{13566}Y_{11,5}^{(c)}}{1024} - \frac{7\sqrt{1330}Y_{11,7}^{(c)}}{1024} - \frac{9\sqrt{42}Y_{11,9}^{(c)}}{1024} \tag{4168c}$$

$$-\frac{9\sqrt{241435194}Y_{11,11}^{(s)}}{535129088} + \frac{63\sqrt{38952831}Y_{11,1}^{(s)}}{20581888} - \frac{81\sqrt{17723538105}Y_{11,3}^{(s)}}{267564544} + \frac{945\sqrt{337591202}Y_{11,5}^{(s)}}{535129088} - \frac{441\sqrt{297874590}Y_{11,7}^{(s)}}{535129088} - \frac{\sqrt{1045174}Y_{11,9}^{(s)}}{1024} \tag{4169a}$$

$$-\frac{\sqrt{285654094}Y_{11,0}^{(c)}}{40199} - \frac{\sqrt{5063868030}Y_{11,2}^{(c)}}{522587} + \frac{6\sqrt{2363138414}Y_{11,4}^{(c)}}{522587} + \frac{\sqrt{29787459}Y_{11,6}^{(c)}}{8567} + \frac{3\sqrt{15677610}Y_{11,8}^{(c)}}{40199} \tag{4169b}$$

$$-\frac{503\sqrt{241435194}Y_{11,11}^{(c)}}{535129088} - \frac{1473\sqrt{38952831}Y_{11,1}^{(c)}}{20581888} - \frac{431\sqrt{17723538105}Y_{11,3}^{(c)}}{267564544} + \frac{20913\sqrt{337591202}Y_{11,5}^{(c)}}{535129088} - \frac{14407\sqrt{297874590}Y_{11,7}^{(c)}}{535129088} + \frac{79013\sqrt{1045174}Y_{11,9}^{(c)}}{535129088} \tag{4169c}$$

$$\frac{9\sqrt{4845323301517270}Y_{11,11}^{(s)}}{136372735759} - \frac{5814\sqrt{367157365505}Y_{11,1}^{(s)}}{10490210443} - \frac{\sqrt{136372735759}Y_{11,3}^{(s)}}{522587} - \frac{14535\sqrt{28638274509390}Y_{11,5}^{(s)}}{136372735759} + \frac{5985\sqrt{32456711110642}Y_{11,7}^{(s)}}{136372735759} \tag{4170a}$$

$$-\frac{62053\sqrt{24232386123330}Y_{11,0}^{(c)}}{671373468352} + \frac{471561\sqrt{1909218300626}Y_{11,2}^{(c)}}{1090981886072} - \frac{787235\sqrt{4091182072770}Y_{11,4}^{(c)}}{4363927544288} - \frac{103\sqrt{81141777776605}Y_{11,6}^{(c)}}{8942474476} + \frac{14619\sqrt{616677511102198}Y_{11,8}^{(c)}}{671373468352} \tag{4170b}$$

$$-\frac{393819\sqrt{4845323301517270}Y_{11,11}^{(c)}}{34911420354304} - \frac{293385\sqrt{367157365505}Y_{11,1}^{(c)}}{1342746936704} - \frac{9416093\sqrt{136372735759}Y_{11,3}^{(c)}}{17455710177152}$$
$$+ \frac{596587\sqrt{28638274509390}Y_{11,5}^{(c)}}{34911420354304} + \frac{2946549\sqrt{32456711110642}Y_{11,7}^{(c)}}{34911420354304} + \frac{106853\sqrt{9250162666532970}Y_{11,9}^{(c)}}{34911420354304} \tag{4170c}$$

$$-\frac{3677\sqrt{101640195011263370}Y_{11,11}^{(s)}}{69473817505990} + \frac{228084\sqrt{7676856834411895}Y_{11,1}^{(s)}}{34736908752995} - \frac{686279\sqrt{3543164692805490}Y_{11,5}^{(s)}}{69473817505990} - \frac{1059251\sqrt{13894763501198}Y_{11,7}^{(s)}}{6947381750599} \tag{4171a}$$

$$-\frac{737263\sqrt{506672551071185070}Y_{11,0}^{(c)}}{2223162160191680} - \frac{74113\sqrt{2362109795203665}Y_{11,2}^{(c)}}{55579054004792} + \frac{4348849\sqrt{248021528496384830}Y_{11,4}^{(c)}}{1111581080095840} - \frac{3512157\sqrt{34736908752995}Y_{11,6}^{(c)}}{27789527002396} + \frac{2650377\sqrt{264000506522762}Y_{11,8}^{(c)}}{444632432038336} \tag{4171b}$$

$$\frac{6902089\sqrt{101640195011263370}Y_{11,11}^{(c)}}{8892648640766720} + \frac{4704453\sqrt{7676856834411895}Y_{11,1}^{(c)}}{4446324320383360} + \frac{1667043\sqrt{826738428321281}Y_{11,3}^{(c)}}{889264864076672}$$
$$- \frac{26597343\sqrt{3543164692805490}Y_{11,5}^{(c)}}{8892648640766720} - \frac{43360285\sqrt{13894763501198}Y_{11,7}^{(c)}}{1778529728153344} + \frac{\sqrt{3960007597841430}Y_{11,9}^{(c)}}{66804992} \tag{4171c}$$

$$-\frac{2117\sqrt{103767346291931251930}Y_{11,11}^{(s)}}{1123290678429185} - \frac{7\sqrt{160470096918455}Y_{11,1}^{(s)}}{133113535} + \frac{668117\sqrt{12516667559639490}Y_{11,5}^{(s)}}{1123290678429185} - \frac{1400717\sqrt{14185556567591422}Y_{11,7}^{(s)}}{224658135685837} \tag{4172a}$$

$$-\frac{85006479\sqrt{105910263966618030}Y_{11,0}^{(c)}}{17972650854866960} + \frac{11800389\sqrt{834444503975966}Y_{11,2}^{(c)}}{898632542743348} + \frac{1425779\sqrt{87616672917476430}Y_{11,4}^{(c)}}{8986325427433480}$$
$$+ \frac{193449\sqrt{35463891418978555}Y_{11,6}^{(c)}}{449316271371674} - \frac{5409419\sqrt{26952557478423701}Y_{11,8}^{(c)}}{3594530170973392} \tag{4172b}$$

$$-\frac{1001117\sqrt{103767346291931251930}Y_{11,11}^{(c)}}{17972650854866960} - \frac{21347582\sqrt{160470096918455}Y_{11,1}^{(c)}}{1123290678429185} + \frac{10252797\sqrt{2920555763915881}Y_{11,3}^{(c)}}{1797265085486696}$$
$$- \frac{4981571\sqrt{12516667559639490}Y_{11,5}^{(c)}}{2567521550695280} - \frac{2607985\sqrt{14185556567591422}Y_{11,7}^{(c)}}{449316271371674} \tag{4172c}$$

$$-\frac{59\sqrt{81769946790}Y_{11,11}^{(s)}}{16877182} + \frac{5\sqrt{132606430}Y_{11,5}^{(s)}}{16877182} + \frac{6\sqrt{1352585586}Y_{11,7}^{(s)}}{8438591} \tag{4173a}$$

$$-\frac{6135\sqrt{156716690}Y_{11,0}^{(c)}}{135017456} - \frac{2623\sqrt{79563858}Y_{11,2}^{(c)}}{33754364} - \frac{923\sqrt{928245010}Y_{11,4}^{(c)}}{67508728} - \frac{43\sqrt{3381463965}Y_{11,6}^{(c)}}{16877182} - \frac{19\sqrt{25699126134}Y_{11,8}^{(c)}}{135017456} \tag{4173b}$$

$$\frac{\sqrt{81769946790}Y_{11,11}^{(c)}}{135017456} + \frac{129\sqrt{2585825385}Y_{11,1}^{(c)}}{8438591} - \frac{2279\sqrt{278473503}Y_{11,3}^{(c)}}{67508728} + \frac{455\sqrt{132606430}Y_{11,5}^{(c)}}{19288208} - \frac{31\sqrt{1352585586}Y_{11,7}^{(c)}}{16877182} \tag{4173c}$$

30 Group O

30.1 A_1

30.1.1 $A_1 : l = 0$

$$Y_{0,0}^{(c)}$$

(4174a)

30.1.2 $A_1 : l = 4$

$$\frac{\sqrt{21}Y_{4,0}^{(c)}}{6} + \frac{\sqrt{15}Y_{4,4}^{(c)}}{6}$$

(4175a)

30.1.3 $A_1 : l = 6$

$$-\frac{\sqrt{2}Y_{6,0}^{(c)}}{4} + \frac{\sqrt{14}Y_{6,4}^{(c)}}{4}$$

(4176a)

30.1.4 $A_1 : l = 8$

$$\frac{\sqrt{33}Y_{8,0}^{(c)}}{8} + \frac{\sqrt{21}Y_{8,4}^{(c)}}{12} + \frac{\sqrt{195}Y_{8,8}^{(c)}}{24}$$

(4177a)

30.1.5 $A_1 : l = 9$

$$-\frac{\sqrt{102}Y_{9,4}^{(s)}}{12} + \frac{\sqrt{42}Y_{9,8}^{(s)}}{12}$$

(4178a)

30.1.6 $A_1 : l = 10$

$$\frac{\sqrt{390}Y_{10,0}^{(c)}}{48} - \frac{\sqrt{22}Y_{10,4}^{(c)}}{8} - \frac{\sqrt{1122}Y_{10,8}^{(c)}}{48}$$

(4179a)

30.1.7 $A_1 : l = 12$

$$\frac{\sqrt{4458}Y_{12,0}^{(c)}}{96} + \frac{\sqrt{1506890931}Y_{12,12}^{(c)}}{71328} + \frac{5\sqrt{2231229}Y_{12,4}^{(c)}}{23776} + \frac{\sqrt{68636854}Y_{12,8}^{(c)}}{23776}$$

(4180a)

$$-\frac{9\sqrt{16346}Y_{12,12}^{(c)}}{5944} - \frac{\sqrt{11039494}Y_{12,4}^{(c)}}{5944} + \frac{\sqrt{358869}Y_{12,8}^{(c)}}{743}$$

(4181a)

30.2 A_2

30.2.1 $A_2 : l = 3$

$$-Y_{3,2}^{(s)}$$

(4182a)

30.2.2 $A_2 : l = 6$

$$\frac{\sqrt{11}Y_{6,2}^{(c)}}{4} - \frac{\sqrt{5}Y_{6,6}^{(c)}}{4}$$

(4183a)

30.2.3 $A_2 : l = 7$

$$-\frac{\sqrt{78}Y_{7,2}^{(s)}}{12} - \frac{\sqrt{66}Y_{7,6}^{(s)}}{12}$$

(4184a)

30.2.4 $A_2 : l = 9$

$$\frac{\sqrt{3}Y_{9,2}^{(s)}}{4} - \frac{\sqrt{13}Y_{9,6}^{(s)}}{4}$$

(4185a)

30.2.5 $A_2 : l = 10$

$$-\frac{\sqrt{85}Y_{10,10}^{(c)}}{16} + \frac{\sqrt{1482}Y_{10,2}^{(c)}}{48} + \frac{\sqrt{57}Y_{10,6}^{(c)}}{48}$$

(4186a)

30.2.6 $A_2 : l = 11$

$$-\frac{\sqrt{798}Y_{11,10}^{(s)}}{48} - \frac{\sqrt{255}Y_{11,2}^{(s)}}{24} - \frac{3\sqrt{6}Y_{11,6}^{(s)}}{16}$$

(4187a)

30.2.7 $A_2 : l = 12$

$$\frac{\sqrt{627}Y_{12,10}^{(c)}}{48} + \frac{\sqrt{102}Y_{12,2}^{(c)}}{48} - \frac{5\sqrt{7}Y_{12,6}^{(c)}}{16}$$

(4188a)

30.3 E

30.3.1 $E : l = 2$

$$Y_{2,0}^{(c)}$$

(4189a)

$$Y_{2,2}^{(c)}$$

(4189b)

30.3.2 $E : l = 4$

$$\frac{\sqrt{15}Y_{4,0}^{(c)}}{6} - \frac{\sqrt{21}Y_{4,4}^{(c)}}{6}$$

(4190a)

$$-Y_{4,2}^{(c)}$$

(4190b)

30.3.3 $E : l = 5$

$$Y_{5,4}^{(s)} \tag{4191a}$$

$$-Y_{5,2}^{(s)} \tag{4191b}$$

30.3.4 $E : l = 6$

$$\frac{\sqrt{14}Y_{6,0}^{(c)}}{4} + \frac{\sqrt{2}Y_{6,4}^{(c)}}{4} \tag{4192a}$$

$$\frac{\sqrt{5}Y_{6,2}^{(c)}}{4} + \frac{\sqrt{11}Y_{6,6}^{(c)}}{4} \tag{4192b}$$

30.3.5 $E : l = 7$

$$-Y_{7,4}^{(s)} \tag{4193a}$$

$$-\frac{\sqrt{66}Y_{7,2}^{(s)}}{12} + \frac{\sqrt{78}Y_{7,6}^{(s)}}{12} \tag{4193b}$$

30.3.6 $E : l = 8$

$$-\frac{\sqrt{286}Y_{8,0}^{(c)}}{32} + \frac{\sqrt{182}Y_{8,4}^{(c)}}{16} + \frac{\sqrt{10}Y_{8,8}^{(c)}}{32} \tag{4194a}$$

$$Y_{8,6}^{(c)} \tag{4194b}$$

$$\frac{\sqrt{210}Y_{8,0}^{(c)}}{32} + \frac{\sqrt{330}Y_{8,4}^{(c)}}{48} - \frac{\sqrt{6006}Y_{8,8}^{(c)}}{96} \tag{4195a}$$

$$-Y_{8,2}^{(c)} \tag{4195b}$$

30.3.7 $E : l = 9$

$$-\frac{\sqrt{42}Y_{9,4}^{(s)}}{12} - \frac{\sqrt{102}Y_{9,8}^{(s)}}{12} \tag{4196a}$$

$$\frac{\sqrt{13}Y_{9,2}^{(s)}}{4} + \frac{\sqrt{3}Y_{9,6}^{(s)}}{4} \tag{4196b}$$

30.3.8 $E : l = 10$

$$\frac{\sqrt{1914}Y_{10,0}^{(c)}}{48} + \frac{\sqrt{3770}Y_{10,4}^{(c)}}{232} + \frac{\sqrt{192270}Y_{10,8}^{(c)}}{1392} \tag{4197a}$$

$$\frac{\sqrt{121771}Y_{10,10}^{(c)}}{464} + \frac{7\sqrt{870}Y_{10,2}^{(c)}}{464} + \frac{3\sqrt{5655}Y_{10,6}^{(c)}}{464} \tag{4197b}$$

$$\frac{\sqrt{493}Y_{10,4}^{(c)}}{29} - \frac{2\sqrt{87}Y_{10,8}^{(c)}}{29} \tag{4198a}$$

$$\frac{\sqrt{5510}Y_{10,10}^{(c)}}{232} + \frac{\sqrt{19227}Y_{10,2}^{(c)}}{348} - \frac{11\sqrt{2958}Y_{10,6}^{(c)}}{696} \tag{4198b}$$

30.3.9 $E : l = 11$

$$-\frac{\sqrt{11235}Y_{11,4}^{(s)}}{214} - \frac{\sqrt{34561}Y_{11,8}^{(s)}}{214} \tag{4199a}$$

$$\frac{\sqrt{7257810}Y_{11,10}^{(s)}}{5136} - \frac{\sqrt{321}Y_{11,2}^{(s)}}{24} + \frac{3\sqrt{54570}Y_{11,6}^{(s)}}{1712} \tag{4199b}$$

$$-\frac{\sqrt{34561}Y_{11,4}^{(s)}}{214} + \frac{\sqrt{11235}Y_{11,8}^{(s)}}{214} \tag{4200a}$$

$$\frac{9\sqrt{214}Y_{11,10}^{(s)}}{214} - \frac{\sqrt{28462}Y_{11,6}^{(s)}}{214} \tag{4200b}$$

30.3.10 $E : l = 12$

$$-\frac{5\sqrt{134134}Y_{12,0}^{(c)}}{6432} - \frac{\sqrt{5475173}Y_{12,12}^{(c)}}{6432} + \frac{3\sqrt{67}Y_{12,4}^{(c)}}{32} + \frac{\sqrt{908922}Y_{12,8}^{(c)}}{2144} \tag{4201a}$$

$$\frac{5\sqrt{238051}Y_{12,10}^{(c)}}{3216} - \frac{155\sqrt{134}Y_{12,2}^{(c)}}{3216} + \frac{7\sqrt{23919}Y_{12,6}^{(c)}}{3216} \tag{4201b}$$

$$-\frac{\sqrt{281333}Y_{12,0}^{(c)}}{804} + \frac{\sqrt{21574}Y_{12,12}^{(c)}}{201} + \frac{\sqrt{2211}Y_{12,8}^{(c)}}{268} \tag{4202a}$$

$$\frac{41\sqrt{938}Y_{12,10}^{(c)}}{3216} + \frac{\sqrt{1666357}Y_{12,2}^{(c)}}{1608} + \frac{5\sqrt{84018}Y_{12,6}^{(c)}}{3216} \tag{4202b}$$

30.4 T_1

30.4.1 $T_1 : l = 1$

$$-Y_{1,1}^{(s)} \tag{4203a}$$

$$Y_{1,0}^{(c)} \tag{4203b}$$

$$Y_{1,1}^{(c)} \tag{4203c}$$

30.4.2 $T_1 : l = 3$

$$\frac{\sqrt{6}Y_{3,1}^{(s)}}{4} + \frac{\sqrt{10}Y_{3,3}^{(s)}}{4} \tag{4204a}$$

$$Y_{3,0}^{(c)} \tag{4204b}$$

$$-\frac{\sqrt{6}Y_{3,1}^{(c)}}{4} + \frac{\sqrt{10}Y_{3,3}^{(c)}}{4} \tag{4204c}$$

30.4.3 $T_1 : l = 4$

$$-\frac{\sqrt{14}Y_{4,1}^{(c)}}{4} + \frac{\sqrt{2}Y_{4,3}^{(c)}}{4} \tag{4205a}$$

$$Y_{4,4}^{(s)} \tag{4205b}$$

$$-\frac{\sqrt{14}Y_{4,1}^{(s)}}{4} - \frac{\sqrt{2}Y_{4,3}^{(s)}}{4} \tag{4205c}$$

30.4.4 $T_1 : l = 5$

$$-\frac{\sqrt{21}Y_{5,1}^{(s)}}{8} + \frac{9\sqrt{2}Y_{5,3}^{(s)}}{16} - \frac{\sqrt{10}Y_{5,5}^{(s)}}{16} \tag{4206a}$$

$$Y_{5,4}^{(c)} \tag{4206b}$$

$$\frac{\sqrt{21}Y_{5,1}^{(c)}}{8} + \frac{9\sqrt{2}Y_{5,3}^{(c)}}{16} + \frac{\sqrt{10}Y_{5,5}^{(c)}}{16} \tag{4206c}$$

$$-\frac{\sqrt{15}Y_{5,1}^{(s)}}{8} - \frac{\sqrt{70}Y_{5,3}^{(s)}}{16} - \frac{3\sqrt{14}Y_{5,5}^{(s)}}{16} \tag{4207a}$$

$$Y_{5,0}^{(c)} \tag{4207b}$$

$$\frac{\sqrt{15}Y_{5,1}^{(c)}}{8} - \frac{\sqrt{70}Y_{5,3}^{(c)}}{16} + \frac{3\sqrt{14}Y_{5,5}^{(c)}}{16} \tag{4207c}$$

30.4.5 $T_1 : l = 6$

$$\frac{\sqrt{3}Y_{6,1}^{(c)}}{4} + \frac{\sqrt{30}Y_{6,3}^{(c)}}{8} - \frac{\sqrt{22}Y_{6,5}^{(c)}}{8} \tag{4208a}$$

$$Y_{6,4}^{(s)} \tag{4208b}$$

$$\frac{\sqrt{3}Y_{6,1}^{(s)}}{4} - \frac{\sqrt{30}Y_{6,3}^{(s)}}{8} - \frac{\sqrt{22}Y_{6,5}^{(s)}}{8} \tag{4208c}$$

30.4.6 $T_1 : l = 7$

$$\frac{9\sqrt{6}Y_{7,1}^{(s)}}{80} + \frac{5\sqrt{2}Y_{7,3}^{(s)}}{16} + \frac{11\sqrt{22}Y_{7,5}^{(s)}}{80} + \frac{\sqrt{2002}Y_{7,7}^{(s)}}{80} \tag{4209a}$$

$$\frac{3\sqrt{42}Y_{7,0}^{(c)}}{20} - \frac{\sqrt{22}Y_{7,4}^{(c)}}{20} \tag{4209b}$$

$$-\frac{9\sqrt{6}Y_{7,1}^{(c)}}{80} + \frac{5\sqrt{2}Y_{7,3}^{(c)}}{16} - \frac{11\sqrt{22}Y_{7,5}^{(c)}}{80} + \frac{\sqrt{2002}Y_{7,7}^{(c)}}{80} \tag{4209c}$$

$$\frac{\sqrt{154}Y_{7,1}^{(s)}}{20} - \frac{\sqrt{42}Y_{7,5}^{(s)}}{10} + \frac{\sqrt{78}Y_{7,7}^{(s)}}{20} \tag{4210a}$$

$$\frac{\sqrt{22}Y_{7,0}^{(c)}}{20} + \frac{3\sqrt{42}Y_{7,4}^{(c)}}{20} \tag{4210b}$$

$$-\frac{\sqrt{154}Y_{7,1}^{(c)}}{20} + \frac{\sqrt{42}Y_{7,5}^{(c)}}{10} + \frac{\sqrt{78}Y_{7,7}^{(c)}}{20} \tag{4210c}$$

30.4.7 $T_1 : l = 8$

$$-\frac{\sqrt{38038}Y_{8,1}^{(c)}}{304} - \frac{\sqrt{7410}Y_{8,3}^{(c)}}{304} - \frac{\sqrt{38}Y_{8,5}^{(c)}}{16} + \frac{5\sqrt{1330}Y_{8,7}^{(c)}}{304} \tag{4211a}$$

$$\frac{3\sqrt{494}Y_{8,4}^{(s)}}{76} + \frac{\sqrt{1330}Y_{8,8}^{(s)}}{76} \tag{4211b}$$

$$-\frac{\sqrt{38038}Y_{8,1}^{(s)}}{304} + \frac{\sqrt{7410}Y_{8,3}^{(s)}}{304} - \frac{\sqrt{38}Y_{8,5}^{(s)}}{16} - \frac{5\sqrt{1330}Y_{8,7}^{(s)}}{304} \tag{4211c}$$

$$\frac{\sqrt{2090}Y_{8,1}^{(c)}}{76} - \frac{\sqrt{798}Y_{8,3}^{(c)}}{38} + \frac{\sqrt{494}Y_{8,7}^{(c)}}{76} \tag{4212a}$$

$$\frac{\sqrt{1330}Y_{8,4}^{(s)}}{76} - \frac{3\sqrt{494}Y_{8,8}^{(s)}}{76} \tag{4212b}$$

$$\frac{\sqrt{2090}Y_{8,1}^{(s)}}{76} + \frac{\sqrt{798}Y_{8,3}^{(s)}}{38} - \frac{\sqrt{494}Y_{8,7}^{(s)}}{76} \tag{4212c}$$

30.4.8 $T_1 : l = 9$

$$-\frac{21\sqrt{5}Y_{9,1}^{(s)}}{128} - \frac{\sqrt{2310}Y_{9,3}^{(s)}}{128} - \frac{3\sqrt{286}Y_{9,5}^{(s)}}{128} - \frac{3\sqrt{1430}Y_{9,7}^{(s)}}{256} - \frac{\sqrt{24310}Y_{9,9}^{(s)}}{256} \tag{4213a}$$

$$Y_{9,0}^{(c)} \tag{4213b}$$

$$\frac{21\sqrt{5}Y_{9,1}^{(c)}}{128} - \frac{\sqrt{2310}Y_{9,3}^{(c)}}{128} + \frac{3\sqrt{286}Y_{9,5}^{(c)}}{128} - \frac{3\sqrt{1430}Y_{9,7}^{(c)}}{256} + \frac{\sqrt{24310}Y_{9,9}^{(c)}}{256} \tag{4213c}$$

$$-\frac{\sqrt{96811}Y_{9,1}^{(s)}}{86656} + \frac{97\sqrt{369642}Y_{9,3}^{(s)}}{86656} - \frac{\sqrt{6770}Y_{9,5}^{(s)}}{128} - \frac{1337\sqrt{1354}Y_{9,7}^{(s)}}{173312} + \frac{237\sqrt{23018}Y_{9,9}^{(s)}}{173312} \tag{4214a}$$

$$-\frac{6\sqrt{4739}Y_{9,4}^{(c)}}{677} + \frac{5\sqrt{11509}Y_{9,8}^{(c)}}{677} \tag{4214b}$$

$$\frac{\sqrt{96811}Y_{9,1}^{(c)}}{86656} + \frac{97\sqrt{369642}Y_{9,3}^{(c)}}{86656} + \frac{\sqrt{6770}Y_{9,5}^{(c)}}{128} - \frac{1337\sqrt{1354}Y_{9,7}^{(c)}}{173312} - \frac{237\sqrt{23018}Y_{9,9}^{(c)}}{173312} \tag{4214c}$$

$$-\frac{\sqrt{11520509}Y_{9,1}^{(s)}}{5416} + \frac{\sqrt{897702}Y_{9,3}^{(s)}}{2708} + \frac{17\sqrt{161126}Y_{9,7}^{(s)}}{10832} - \frac{33\sqrt{9478}Y_{9,9}^{(s)}}{10832} \tag{4215a}$$

$$\frac{5\sqrt{11509}Y_{9,4}^{(c)}}{677} + \frac{6\sqrt{4739}Y_{9,8}^{(c)}}{677} \tag{4215b}$$

$$\frac{\sqrt{11520509}Y_{9,1}^{(c)}}{5416} + \frac{\sqrt{897702}Y_{9,3}^{(c)}}{2708} + \frac{17\sqrt{161126}Y_{9,7}^{(c)}}{10832} + \frac{33\sqrt{9478}Y_{9,9}^{(c)}}{10832} \tag{4215c}$$

30.4.9 $T_1 : l = 10$

$$\frac{7\sqrt{1677}Y_{10,1}^{(c)}}{688} + \frac{\sqrt{86}Y_{10,3}^{(c)}}{16} + \frac{\sqrt{430}Y_{10,5}^{(c)}}{688} + \frac{11\sqrt{1462}Y_{10,7}^{(c)}}{1376} - \frac{3\sqrt{83334}Y_{10,9}^{(c)}}{1376} \tag{4216a}$$

$$\frac{11\sqrt{43}Y_{10,4}^{(s)}}{86} + \frac{\sqrt{2193}Y_{10,8}^{(s)}}{86} \tag{4216b}$$

$$\frac{7\sqrt{1677}Y_{10,1}^{(s)}}{688} - \frac{\sqrt{86}Y_{10,3}^{(s)}}{16} + \frac{\sqrt{430}Y_{10,5}^{(s)}}{688} - \frac{11\sqrt{1462}Y_{10,7}^{(s)}}{1376} - \frac{3\sqrt{83334}Y_{10,9}^{(s)}}{1376} \tag{4216c}$$

$$-\frac{\sqrt{9503}Y_{10,1}^{(c)}}{344} + \frac{\sqrt{21930}Y_{10,5}^{(c)}}{172} - \frac{13\sqrt{258}Y_{10,7}^{(c)}}{688} - \frac{5\sqrt{1634}Y_{10,9}^{(c)}}{688} \tag{4217a}$$

$$\frac{\sqrt{2193}Y_{10,4}^{(s)}}{86} - \frac{11\sqrt{43}Y_{10,8}^{(s)}}{86} \tag{4217b}$$

$$-\frac{\sqrt{9503}Y_{10,1}^{(s)}}{344} + \frac{\sqrt{21930}Y_{10,5}^{(s)}}{172} + \frac{13\sqrt{258}Y_{10,7}^{(s)}}{688} - \frac{5\sqrt{1634}Y_{10,9}^{(s)}}{688} \tag{4217c}$$

30.4.10 $T_1 : l = 11$

$$-\frac{\sqrt{24388210}Y_{11,11}^{(s)}}{106688} - \frac{7\sqrt{1842035}Y_{11,1}^{(s)}}{53344} + \frac{33\sqrt{198373}Y_{11,3}^{(s)}}{53344} + \frac{9\sqrt{850170}Y_{11,5}^{(s)}}{106688} - \frac{\sqrt{3334}Y_{11,7}^{(s)}}{64} - \frac{29\sqrt{950190}Y_{11,9}^{(s)}}{106688} \tag{4218a}$$

$$-\frac{\sqrt{121574310}Y_{11,0}^{(c)}}{26672} + \frac{3\sqrt{5951190}Y_{11,4}^{(c)}}{13336} - \frac{77\sqrt{63346}Y_{11,8}^{(c)}}{26672} \tag{4218b}$$

$$-\frac{\sqrt{24388210}Y_{11,11}^{(c)}}{106688} + \frac{7\sqrt{1842035}Y_{11,1}^{(c)}}{53344} + \frac{33\sqrt{198373}Y_{11,3}^{(c)}}{53344} - \frac{9\sqrt{850170}Y_{11,5}^{(c)}}{106688} - \frac{\sqrt{3334}Y_{11,7}^{(c)}}{64} + \frac{29\sqrt{950190}Y_{11,9}^{(c)}}{106688} \tag{4218c}$$

$$\frac{109\sqrt{7000809882}Y_{11,11}^{(s)}}{15763152} + \frac{31\sqrt{89652927}Y_{11,1}^{(s)}}{1313596} + \frac{3\sqrt{4925985}Y_{11,3}^{(s)}}{13336} + \frac{3331\sqrt{4597586}Y_{11,5}^{(s)}}{15763152} + \frac{41\sqrt{1485020278}Y_{11,9}^{(s)}}{3940788} \tag{4219a}$$

$$\frac{557\sqrt{657454798}Y_{11,0}^{(c)}}{15763152} + \frac{1639\sqrt{656798}Y_{11,4}^{(c)}}{7881576} - \frac{41\sqrt{22275304170}Y_{11,8}^{(c)}}{15763152} \tag{4219b}$$

$$\frac{109\sqrt{7000809882}Y_{11,11}^{(c)}}{15763152} - \frac{31\sqrt{89652927}Y_{11,1}^{(c)}}{1313596} + \frac{3\sqrt{4925985}Y_{11,3}^{(c)}}{13336} - \frac{3331\sqrt{4597586}Y_{11,5}^{(c)}}{15763152} - \frac{41\sqrt{1485020278}Y_{11,9}^{(c)}}{3940788} \tag{4219c}$$

$$\frac{\sqrt{914277}Y_{11,11}^{(s)}}{2364} + \frac{\sqrt{247038}Y_{11,1}^{(s)}}{788} - \frac{\sqrt{535249}Y_{11,5}^{(s)}}{2364} - \frac{\sqrt{478907}Y_{11,9}^{(s)}}{1182} \tag{4220a}$$

$$\frac{7\sqrt{3743}Y_{11,0}^{(c)}}{4728} + \frac{\sqrt{3746743}Y_{11,4}^{(c)}}{2364} + \frac{\sqrt{7183605}Y_{11,8}^{(c)}}{4728} \tag{4220b}$$

$$\frac{\sqrt{914277}Y_{11,11}^{(c)}}{2364} - \frac{\sqrt{247038}Y_{11,1}^{(c)}}{788} + \frac{\sqrt{535249}Y_{11,5}^{(c)}}{2364} + \frac{\sqrt{478907}Y_{11,9}^{(c)}}{1182} \tag{4220c}$$

30.4.11 $T_1 : l = 12$

$$\frac{3\sqrt{976074}Y_{12,11}^{(c)}}{41152} - \frac{\sqrt{47976159}Y_{12,1}^{(c)}}{20576} - \frac{17\sqrt{207689}Y_{12,3}^{(c)}}{20576} + \frac{75\sqrt{24434}Y_{12,5}^{(c)}}{41152} + \frac{147\sqrt{27006}Y_{12,7}^{(c)}}{41152} - \frac{\sqrt{1286}Y_{12,9}^{(c)}}{64} \tag{4221a}$$

$$\frac{\sqrt{162679}Y_{12,12}^{(s)}}{10288} - \frac{3\sqrt{207689}Y_{12,4}^{(s)}}{10288} + \frac{31\sqrt{27006}Y_{12,8}^{(s)}}{5144} \tag{4221b}$$

$$-\frac{3\sqrt{976074}Y_{12,11}^{(s)}}{41152} - \frac{\sqrt{47976159}Y_{12,1}^{(s)}}{20576} + \frac{17\sqrt{207689}Y_{12,3}^{(s)}}{20576} + \frac{75\sqrt{24434}Y_{12,5}^{(s)}}{41152} - \frac{147\sqrt{27006}Y_{12,7}^{(s)}}{41152} - \frac{\sqrt{1286}Y_{12,9}^{(s)}}{64} \tag{4221c}$$

$$-\frac{91\sqrt{899614870}Y_{12,11}^{(c)}}{4063760} - \frac{\sqrt{902408705}Y_{12,1}^{(c)}}{1015940} + \frac{29\sqrt{1722780255}Y_{12,3}^{(c)}}{2031880} + \frac{99\sqrt{202680030}Y_{12,5}^{(c)}}{4063760} + \frac{\sqrt{507970}Y_{12,7}^{(c)}}{2572} \tag{4222a}$$

$$\frac{31\sqrt{1349422305}Y_{12,12}^{(s)}}{4063760} - \frac{93\sqrt{1722780255}Y_{12,4}^{(s)}}{4063760} - \frac{\sqrt{507970}Y_{12,8}^{(s)}}{5144} \tag{4222b}$$

$$\frac{91\sqrt{899614870}Y_{12,11}^{(s)}}{4063760} - \frac{\sqrt{902408705}Y_{12,1}^{(s)}}{1015940} - \frac{29\sqrt{1722780255}Y_{12,3}^{(s)}}{2031880} + \frac{99\sqrt{202680030}Y_{12,5}^{(s)}}{4063760} - \frac{\sqrt{507970}Y_{12,7}^{(s)}}{2572} \tag{4222c}$$

$$\frac{\sqrt{382755}Y_{12,11}^{(c)}}{3160} - \frac{\sqrt{381570}Y_{12,1}^{(c)}}{790} + \frac{3\sqrt{199870}Y_{12,3}^{(c)}}{3160} - \frac{\sqrt{1698895}Y_{12,5}^{(c)}}{3160} \tag{4223a}$$

$$\frac{3\sqrt{255170}Y_{12,12}^{(s)}}{1580} + \frac{\sqrt{199870}Y_{12,4}^{(s)}}{1580} \tag{4223b}$$

$$-\frac{\sqrt{382755}Y_{12,11}^{(s)}}{3160} - \frac{\sqrt{381570}Y_{12,1}^{(s)}}{790} - \frac{3\sqrt{199870}Y_{12,3}^{(s)}}{3160} - \frac{\sqrt{1698895}Y_{12,5}^{(s)}}{3160} \tag{4223c}$$

30.5 T_2

30.5.1 $T_2 : l = 2$

$$-Y_{2,2}^{(s)} \tag{4224a}$$

$$-Y_{2,1}^{(s)} \tag{4224b}$$

$$Y_{2,1}^{(c)} \tag{4224c}$$

30.5.2 $T_2 : l = 3$

$$Y_{3,2}^{(c)} \tag{4225a}$$

$$-\frac{\sqrt{10}Y_{3,1}^{(c)}}{4} - \frac{\sqrt{6}Y_{3,3}^{(c)}}{4} \tag{4225b}$$

$$-\frac{\sqrt{10}Y_{3,1}^{(s)}}{4} + \frac{\sqrt{6}Y_{3,3}^{(s)}}{4} \tag{4225c}$$

30.5.3 $T_2 : l = 4$

$$Y_{4,2}^{(s)} \tag{4226a}$$

$$-\frac{\sqrt{2}Y_{4,1}^{(s)}}{4} + \frac{\sqrt{14}Y_{4,3}^{(s)}}{4} \tag{4226b}$$

$$\frac{\sqrt{2}Y_{4,1}^{(c)}}{4} + \frac{\sqrt{14}Y_{4,3}^{(c)}}{4} \tag{4226c}$$

30.5.4 $T_2 : l = 5$

$$-Y_{5,2}^{(c)} \tag{4227a}$$

$$-\frac{\sqrt{7}Y_{5,1}^{(c)}}{4} + \frac{\sqrt{6}Y_{5,3}^{(c)}}{8} + \frac{\sqrt{30}Y_{5,5}^{(c)}}{8} \tag{4227b}$$

$$-\frac{\sqrt{7}Y_{5,1}^{(s)}}{4} - \frac{\sqrt{6}Y_{5,3}^{(s)}}{8} + \frac{\sqrt{30}Y_{5,5}^{(s)}}{8} \tag{4227c}$$

30.5.5 $T_2 : l = 6$

$$-\frac{9\sqrt{34}Y_{6,2}^{(s)}}{68} + \frac{\sqrt{1870}Y_{6,6}^{(s)}}{68} \tag{4228a}$$

$$\frac{3\sqrt{85}Y_{6,1}^{(s)}}{68} + \frac{\sqrt{34}Y_{6,3}^{(s)}}{8} - \frac{\sqrt{5610}Y_{6,5}^{(s)}}{136} \tag{4228b}$$

$$-\frac{3\sqrt{85}Y_{6,1}^{(c)}}{68} + \frac{\sqrt{34}Y_{6,3}^{(c)}}{8} + \frac{\sqrt{5610}Y_{6,5}^{(c)}}{136} \tag{4228c}$$

$$-\frac{\sqrt{1870}Y_{6,2}^{(s)}}{68} - \frac{9\sqrt{34}Y_{6,6}^{(s)}}{68} \tag{4229a}$$

$$-\frac{\sqrt{187}Y_{6,1}^{(s)}}{17} - \frac{\sqrt{102}Y_{6,5}^{(s)}}{17} \tag{4229b}$$

$$\frac{\sqrt{187}Y_{6,1}^{(c)}}{17} + \frac{\sqrt{102}Y_{6,5}^{(c)}}{17} \tag{4229c}$$

30.5.6 $T_2 : l = 7$

$$Y_{7,2}^{(c)} \tag{4230a}$$

$$-\frac{15\sqrt{6}Y_{7,1}^{(c)}}{64} + \frac{19\sqrt{2}Y_{7,3}^{(c)}}{64} - \frac{\sqrt{22}Y_{7,5}^{(c)}}{64} - \frac{\sqrt{2002}Y_{7,7}^{(c)}}{64} \tag{4230b}$$

$$-\frac{15\sqrt{6}Y_{7,1}^{(s)}}{64} - \frac{19\sqrt{2}Y_{7,3}^{(s)}}{64} - \frac{\sqrt{22}Y_{7,5}^{(s)}}{64} + \frac{\sqrt{2002}Y_{7,7}^{(s)}}{64} \tag{4230c}$$

$$-Y_{7,6}^{(c)} \tag{4231a}$$

$$\frac{\sqrt{858}Y_{7,1}^{(c)}}{64} + \frac{3\sqrt{286}Y_{7,3}^{(c)}}{64} + \frac{5\sqrt{26}Y_{7,5}^{(c)}}{64} + \frac{\sqrt{14}Y_{7,7}^{(c)}}{64} \tag{4231b}$$

$$\frac{\sqrt{858}Y_{7,1}^{(s)}}{64} - \frac{3\sqrt{286}Y_{7,3}^{(s)}}{64} + \frac{5\sqrt{26}Y_{7,5}^{(s)}}{64} - \frac{\sqrt{14}Y_{7,7}^{(s)}}{64} \tag{4231c}$$

30.5.7 $T_2 : l = 8$

$$\frac{3\sqrt{1551}Y_{8,2}^{(s)}}{188} + \frac{\sqrt{21385}Y_{8,6}^{(s)}}{188} \tag{4232a}$$

$$-\frac{\sqrt{108570}Y_{8,1}^{(s)}}{752} + \frac{\sqrt{94}Y_{8,3}^{(s)}}{16} + \frac{\sqrt{18330}Y_{8,5}^{(s)}}{752} + \frac{3\sqrt{25662}Y_{8,7}^{(s)}}{752} \tag{4232b}$$

$$\frac{\sqrt{108570}Y_{8,1}^{(c)}}{752} + \frac{\sqrt{94}Y_{8,3}^{(c)}}{16} - \frac{\sqrt{18330}Y_{8,5}^{(c)}}{752} + \frac{3\sqrt{25662}Y_{8,7}^{(c)}}{752} \tag{4232c}$$

$$-\frac{\sqrt{21385}Y_{8,2}^{(s)}}{188} + \frac{3\sqrt{1551}Y_{8,6}^{(s)}}{188} \tag{4233a}$$

$$-\frac{\sqrt{1222}Y_{8,1}^{(s)}}{188} + \frac{\sqrt{7238}Y_{8,5}^{(s)}}{94} - \frac{\sqrt{5170}Y_{8,7}^{(s)}}{188} \tag{4233b}$$

$$\frac{\sqrt{1222}Y_{8,1}^{(c)}}{188} - \frac{\sqrt{7238}Y_{8,5}^{(c)}}{94} - \frac{\sqrt{5170}Y_{8,7}^{(c)}}{188} \tag{4233c}$$

30.5.8 $T_2 : l = 9$

$$\frac{\sqrt{286}Y_{9,2}^{(c)}}{44} - \frac{5\sqrt{66}Y_{9,6}^{(c)}}{44} \tag{4234a}$$

$$-\frac{\sqrt{13}Y_{9,1}^{(c)}}{16} - \frac{\sqrt{6006}Y_{9,3}^{(c)}}{176} + \frac{\sqrt{110}Y_{9,5}^{(c)}}{16} + \frac{41\sqrt{22}Y_{9,7}^{(c)}}{352} - \frac{3\sqrt{374}Y_{9,9}^{(c)}}{352} \tag{4234b}$$

$$-\frac{\sqrt{13}Y_{9,1}^{(s)}}{16} + \frac{\sqrt{6006}Y_{9,3}^{(s)}}{176} + \frac{\sqrt{110}Y_{9,5}^{(s)}}{16} - \frac{41\sqrt{22}Y_{9,7}^{(s)}}{352} - \frac{3\sqrt{374}Y_{9,9}^{(s)}}{352} \tag{4234c}$$

$$\frac{5\sqrt{66}Y_{9,2}^{(c)}}{44} + \frac{\sqrt{286}Y_{9,6}^{(c)}}{44} \tag{4235a}$$

$$\frac{3\sqrt{3}Y_{9,1}^{(c)}}{8} - \frac{\sqrt{154}Y_{9,3}^{(c)}}{44} - \frac{\sqrt{858}Y_{9,7}^{(c)}}{176} - \frac{\sqrt{14586}Y_{9,9}^{(c)}}{176} \tag{4235b}$$

$$\frac{3\sqrt{3}Y_{9,1}^{(s)}}{8} + \frac{\sqrt{154}Y_{9,3}^{(s)}}{44} + \frac{\sqrt{858}Y_{9,7}^{(s)}}{176} - \frac{\sqrt{14586}Y_{9,9}^{(s)}}{176} \tag{4235c}$$

30.5.9 $T_2 : l = 10$

$$\frac{\sqrt{26410}Y_{10,10}^{(s)}}{2224} - \frac{7\sqrt{92157}Y_{10,2}^{(s)}}{3336} + \frac{43\sqrt{14178}Y_{10,6}^{(s)}}{6672} \tag{4236a}$$

$$\frac{3\sqrt{30719}Y_{10,1}^{(s)}}{2224} - \frac{11\sqrt{14178}Y_{10,3}^{(s)}}{6672} - \frac{7\sqrt{70890}Y_{10,5}^{(s)}}{6672} + \frac{\sqrt{834}Y_{10,7}^{(s)}}{32} - \frac{7\sqrt{5282}Y_{10,9}^{(s)}}{4448} \tag{4236b}$$

$$-\frac{3\sqrt{30719}Y_{10,1}^{(c)}}{2224} - \frac{11\sqrt{14178}Y_{10,3}^{(c)}}{6672} + \frac{7\sqrt{70890}Y_{10,5}^{(c)}}{6672} + \frac{\sqrt{834}Y_{10,7}^{(c)}}{32} + \frac{7\sqrt{5282}Y_{10,9}^{(c)}}{4448} \tag{4236c}$$

$$-\frac{113\sqrt{215415806}Y_{10,10}^{(s)}}{2667688} - \frac{313\sqrt{65024895}Y_{10,2}^{(s)}}{4001532} - \frac{1175\sqrt{10003830}Y_{10,6}^{(s)}}{8003064} \tag{4237a}$$

$$-\frac{201\sqrt{21674965}Y_{10,1}^{(s)}}{1333844} + \frac{223\sqrt{10003830}Y_{10,3}^{(s)}}{8003064} - \frac{\sqrt{2000766}Y_{10,5}^{(s)}}{3336} - \frac{23\sqrt{1077079030}Y_{10,9}^{(s)}}{1333844} \tag{4237b}$$

$$\frac{201\sqrt{21674965}Y_{10,1}^{(c)}}{1333844} + \frac{223\sqrt{10003830}Y_{10,3}^{(c)}}{8003064} + \frac{\sqrt{2000766}Y_{10,5}^{(c)}}{3336} + \frac{23\sqrt{1077079030}Y_{10,9}^{(c)}}{1333844} \tag{4237c}$$

$$\frac{13\sqrt{5301790}Y_{10,10}^{(s)}}{38384} - \frac{23\sqrt{136743}Y_{10,2}^{(s)}}{19192} - \frac{9\sqrt{3555318}Y_{10,6}^{(s)}}{38384} \tag{4238a}$$

$$\frac{5\sqrt{45581}Y_{10,1}^{(s)}}{2399} + \frac{\sqrt{3555318}Y_{10,3}^{(s)}}{2399} - \frac{\sqrt{1060358}Y_{10,9}^{(s)}}{2399} \tag{4238b}$$

$$-\frac{5\sqrt{45581}Y_{10,1}^{(c)}}{2399} + \frac{\sqrt{3555318}Y_{10,3}^{(c)}}{2399} + \frac{\sqrt{1060358}Y_{10,9}^{(c)}}{2399} \tag{4238c}$$

30.5.10 $T_2 : l = 11$

$$-\frac{3\sqrt{2037}Y_{11,10}^{(c)}}{1552} + \frac{\sqrt{939930}Y_{11,2}^{(c)}}{4656} - \frac{61\sqrt{5529}Y_{11,6}^{(c)}}{4656} \tag{4239a}$$

$$\frac{\sqrt{44814}Y_{11,11}^{(c)}}{18624} + \frac{\sqrt{1221909}Y_{11,1}^{(c)}}{3104} + \frac{\sqrt{3289755}Y_{11,3}^{(c)}}{9312} - \frac{13\sqrt{62662}Y_{11,5}^{(c)}}{6208} + \frac{29\sqrt{55290}Y_{11,7}^{(c)}}{18624} + \frac{3\sqrt{194}Y_{11,9}^{(c)}}{64} \tag{4239b}$$

$$-\frac{\sqrt{44814}Y_{11,11}^{(s)}}{18624} + \frac{\sqrt{1221909}Y_{11,1}^{(s)}}{3104} - \frac{\sqrt{3289755}Y_{11,3}^{(s)}}{9312} - \frac{13\sqrt{62662}Y_{11,5}^{(s)}}{6208} - \frac{29\sqrt{55290}Y_{11,7}^{(s)}}{18624} + \frac{3\sqrt{194}Y_{11,9}^{(s)}}{64} \tag{4239c}$$

$$\frac{\sqrt{2390371}Y_{11,10}^{(c)}}{1552} + \frac{3\sqrt{149712710}Y_{11,2}^{(c)}}{2012944} - \frac{183\sqrt{880663}Y_{11,6}^{(c)}}{2012944} \tag{4240a}$$

$$-\frac{\sqrt{52588162}Y_{11,11}^{(c)}}{2012944} - \frac{11\sqrt{194626523}Y_{11,1}^{(c)}}{503236} - \frac{213\sqrt{10693765}Y_{11,3}^{(c)}}{1006472} - \frac{131\sqrt{89827626}Y_{11,5}^{(c)}}{2012944} - \frac{37\sqrt{8806630}Y_{11,7}^{(c)}}{503236} \tag{4240b}$$

$$\frac{\sqrt{52588162}Y_{11,11}^{(s)}}{2012944} - \frac{11\sqrt{194626523}Y_{11,1}^{(s)}}{503236} + \frac{213\sqrt{10693765}Y_{11,3}^{(s)}}{1006472} - \frac{131\sqrt{89827626}Y_{11,5}^{(s)}}{2012944} + \frac{37\sqrt{8806630}Y_{11,7}^{(s)}}{503236} \tag{4240c}$$

$$-\frac{61\sqrt{3891}Y_{11,2}^{(c)}}{3891} - \frac{\sqrt{661470}Y_{11,6}^{(c)}}{3891} \tag{4241a}$$

$$\frac{\sqrt{483865305}Y_{11,11}^{(c)}}{31128} + \frac{\sqrt{505830}Y_{11,1}^{(c)}}{1297} - \frac{53\sqrt{54474}Y_{11,3}^{(c)}}{31128} + \frac{25\sqrt{6485}Y_{11,5}^{(c)}}{10376} - \frac{\sqrt{66147}Y_{11,7}^{(c)}}{3891} \tag{4241b}$$

$$-\frac{\sqrt{483865305}Y_{11,11}^{(s)}}{31128} + \frac{\sqrt{505830}Y_{11,1}^{(s)}}{1297} + \frac{53\sqrt{54474}Y_{11,3}^{(s)}}{31128} + \frac{25\sqrt{6485}Y_{11,5}^{(s)}}{10376} + \frac{\sqrt{66147}Y_{11,7}^{(s)}}{3891} \tag{4241c}$$

30.5.11 $T_2 : l = 12$

$$-Y_{12,10}^{(s)} \tag{4242a}$$

$$-\frac{5\sqrt{46}Y_{12,11}^{(s)}}{1024} + \frac{5\sqrt{2261}Y_{12,1}^{(s)}}{512} - \frac{\sqrt{10659}Y_{12,3}^{(s)}}{512} - \frac{19\sqrt{1254}Y_{12,5}^{(s)}}{1024} - \frac{43\sqrt{154}Y_{12,7}^{(s)}}{1024} - \frac{25\sqrt{66}Y_{12,9}^{(s)}}{1024} \tag{4242b}$$

$$-\frac{5\sqrt{46}Y_{12,11}^{(c)}}{1024} - \frac{5\sqrt{2261}Y_{12,1}^{(c)}}{512} - \frac{\sqrt{10659}Y_{12,3}^{(c)}}{512} + \frac{19\sqrt{1254}Y_{12,5}^{(c)}}{1024} - \frac{43\sqrt{154}Y_{12,7}^{(c)}}{1024} + \frac{25\sqrt{66}Y_{12,9}^{(c)}}{1024} \tag{4242c}$$

$$\frac{45\sqrt{450606}Y_{12,2}^{(s)}}{75101} + \frac{23\sqrt{8937019}Y_{12,6}^{(s)}}{75101} \tag{4243a}$$

$$\frac{251\sqrt{36823071714}Y_{12,11}^{(s)}}{76903424} - \frac{2225\sqrt{17348331}Y_{12,1}^{(s)}}{38451712} + \frac{\sqrt{75101}Y_{12,3}^{(s)}}{512} - \frac{18825\sqrt{2553434}Y_{12,5}^{(s)}}{76903424} - \frac{217\sqrt{1018820166}Y_{12,7}^{(s)}}{76903424} + \frac{3527\sqrt{48515246}Y_{12,9}^{(s)}}{76903424} \tag{4243b}$$

$$\frac{251\sqrt{36823071714}Y_{12,11}^{(c)}}{76903424} + \frac{2225\sqrt{17348331}Y_{12,1}^{(c)}}{38451712} + \frac{\sqrt{75101}Y_{12,3}^{(c)}}{512} + \frac{18825\sqrt{2553434}Y_{12,5}^{(c)}}{76903424} - \frac{217\sqrt{1018820166}Y_{12,7}^{(c)}}{76903424} - \frac{3527\sqrt{48515246}Y_{12,9}^{(c)}}{76903424} \tag{4243c}$$

$$\frac{23\sqrt{8937019}Y_{12,2}^{(s)}}{75101} - \frac{45\sqrt{450606}Y_{12,6}^{(s)}}{75101} \tag{4244a}$$

$$\frac{\sqrt{2527073549}Y_{12,11}^{(s)}}{150202} + \frac{3\sqrt{28087774}Y_{12,1}^{(s)}}{600808} - \frac{25\sqrt{1577121}Y_{12,5}^{(s)}}{150202} + \frac{275\sqrt{1426919}Y_{12,7}^{(s)}}{600808} - \frac{81\sqrt{29965299}Y_{12,9}^{(s)}}{600808} \tag{4244b}$$

$$\frac{\sqrt{2527073549}Y_{12,11}^{(c)}}{150202} - \frac{3\sqrt{28087774}Y_{12,1}^{(c)}}{600808} + \frac{25\sqrt{1577121}Y_{12,5}^{(c)}}{150202} + \frac{275\sqrt{1426919}Y_{12,7}^{(c)}}{600808} + \frac{81\sqrt{29965299}Y_{12,9}^{(c)}}{600808} \tag{4244c}$$

31   Group T_d

31.1 A_1

31.1.1 $A_1 : l = 0$

$$Y_{0,0}^{(c)} \tag{4245a}$$

31.1.2 $A_1 : l = 3$

$$-Y_{3,2}^{(s)} \tag{4246a}$$

31.1.3 $A_1 : l = 4$

$$\frac{\sqrt{21}Y_{4,0}^{(c)}}{6} + \frac{\sqrt{15}Y_{4,4}^{(c)}}{6} \tag{4247a}$$

31.1.4 $A_1 : l = 6$

$$-\frac{\sqrt{2}Y_{6,0}^{(c)}}{4} + \frac{\sqrt{14}Y_{6,4}^{(c)}}{4} \tag{4248a}$$

31.1.5 $A_1 : l = 7$

$$-\frac{\sqrt{78}Y_{7,2}^{(s)}}{12} - \frac{\sqrt{66}Y_{7,6}^{(s)}}{12} \tag{4249a}$$

31.1.6 $A_1 : l = 8$

$$\frac{\sqrt{33}Y_{8,0}^{(c)}}{8} + \frac{\sqrt{21}Y_{8,4}^{(c)}}{12} + \frac{\sqrt{195}Y_{8,8}^{(c)}}{24} \tag{4250a}$$

31.1.7 $A_1 : l = 9$

$$\frac{\sqrt{3}Y_{9,2}^{(s)}}{4} - \frac{\sqrt{13}Y_{9,6}^{(s)}}{4} \tag{4251a}$$

31.1.8 $A_1 : l = 10$

$$\frac{\sqrt{390}Y_{10,0}^{(c)}}{48} - \frac{\sqrt{22}Y_{10,4}^{(c)}}{8} - \frac{\sqrt{1122}Y_{10,8}^{(c)}}{48} \tag{4252a}$$

31.1.9 $A_1 : l = 11$

$$-\frac{\sqrt{798}Y_{11,10}^{(s)}}{48} - \frac{\sqrt{255}Y_{11,2}^{(s)}}{24} - \frac{3\sqrt{6}Y_{11,6}^{(s)}}{16} \tag{4253a}$$

31.1.10 $A_1 : l = 12$

$$\frac{\sqrt{4458}Y_{12,0}^{(c)}}{96} + \frac{\sqrt{1506890931}Y_{12,12}^{(c)}}{71328} + \frac{5\sqrt{2231229}Y_{12,4}^{(c)}}{23776} + \frac{\sqrt{68636854}Y_{12,8}^{(c)}}{23776} \tag{4254a}$$

$$-\frac{9\sqrt{16346}Y_{12,12}^{(c)}}{5944} - \frac{\sqrt{11039494}Y_{12,4}^{(c)}}{5944} + \frac{\sqrt{358869}Y_{12,8}^{(c)}}{743} \tag{4255a}$$

31.2 A_2

31.2.1 $A_2 : l = 6$

$$\frac{\sqrt{11}Y_{6,2}^{(c)}}{4} - \frac{\sqrt{5}Y_{6,6}^{(c)}}{4} \tag{4256a}$$

31.2.2 $A_2 : l = 9$

$$-\frac{\sqrt{102}Y_{9,4}^{(s)}}{12} + \frac{\sqrt{42}Y_{9,8}^{(s)}}{12} \tag{4257a}$$

31.2.3 $A_2 : l = 10$

$$-\frac{\sqrt{85}Y_{10,10}^{(c)}}{16} + \frac{\sqrt{1482}Y_{10,2}^{(c)}}{48} + \frac{\sqrt{57}Y_{10,6}^{(c)}}{48} \tag{4258a}$$

31.2.4 $A_2 : l = 12$

$$\frac{\sqrt{627}Y_{12,10}^{(c)}}{48} + \frac{\sqrt{102}Y_{12,2}^{(c)}}{48} - \frac{5\sqrt{7}Y_{12,6}^{(c)}}{16} \tag{4259a}$$

31.3 E

31.3.1 $E : l = 2$

$$Y_{2,2}^{(c)} \tag{4260a}$$

$$Y_{2,0}^{(c)} \tag{4260b}$$

31.3.2 $E : l = 4$

$$Y_{4,2}^{(c)} \tag{4261a}$$

$$\frac{\sqrt{15}Y_{4,0}^{(c)}}{6} - \frac{\sqrt{21}Y_{4,4}^{(c)}}{6} \tag{4261b}$$

31.3.3 $E : l = 5$

$$Y_{5,4}^{(s)} \tag{4262a}$$

$$Y_{5,2}^{(s)} \tag{4262b}$$

31.3.4 $E : l = 6$

$$\frac{\sqrt{14}Y_{6,0}^{(c)}}{4} + \frac{\sqrt{2}Y_{6,4}^{(c)}}{4} \tag{4263a}$$

$$\frac{\sqrt{5}Y_{6,2}^{(c)}}{4} + \frac{\sqrt{11}Y_{6,6}^{(c)}}{4} \tag{4263b}$$

31.3.5 $E : l = 7$

$$Y_{7,4}^{(s)} \tag{4264a}$$

$$-\frac{\sqrt{66}Y_{7,2}^{(s)}}{12} + \frac{\sqrt{78}Y_{7,6}^{(s)}}{12} \tag{4264b}$$

31.3.6 $E : l = 8$

$$Y_{8,6}^{(c)} \tag{4265a}$$

$$\frac{\sqrt{286}Y_{8,0}^{(c)}}{32} - \frac{\sqrt{182}Y_{8,4}^{(c)}}{16} - \frac{\sqrt{10}Y_{8,8}^{(c)}}{32} \tag{4265b}$$

$$Y_{8,2}^{(c)} \tag{4266a}$$

$$\frac{\sqrt{210}Y_{8,0}^{(c)}}{32} + \frac{\sqrt{330}Y_{8,4}^{(c)}}{48} - \frac{\sqrt{6006}Y_{8,8}^{(c)}}{96} \tag{4266b}$$

31.3.7 $E : l = 9$

$$\frac{\sqrt{13}Y_{9,2}^{(s)}}{4} + \frac{\sqrt{3}Y_{9,6}^{(s)}}{4} \tag{4267a}$$

$$\frac{\sqrt{42}Y_{9,4}^{(s)}}{12} + \frac{\sqrt{102}Y_{9,8}^{(s)}}{12} \tag{4267b}$$

31.3.8 $E : l = 10$

$$\frac{\sqrt{1209635}Y_{10,10}^{(c)}}{11984} - \frac{19\sqrt{58422}Y_{10,2}^{(c)}}{35952} + \frac{\sqrt{2247}Y_{10,6}^{(c)}}{48} \tag{4268a}$$

$$\frac{3\sqrt{3213210}Y_{10,0}^{(c)}}{11984} - \frac{83\sqrt{1498}Y_{10,4}^{(c)}}{5992} + \frac{31\sqrt{76398}Y_{10,8}^{(c)}}{11984} \tag{4268b}$$

$$\frac{\sqrt{370006}Y_{10,10}^{(c)}}{749} + \frac{\sqrt{190995}Y_{10,2}^{(c)}}{749} \tag{4269a}$$

$$-\frac{11\sqrt{420189}Y_{10,0}^{(c)}}{8988} - \frac{\sqrt{827645}Y_{10,4}^{(c)}}{1498} + \frac{\sqrt{146055}Y_{10,8}^{(c)}}{8988} \tag{4269b}$$

31.3.9 $E : l = 11$

$$Y_{11,4}^{(s)} \tag{4270a}$$

$$\frac{\sqrt{646}Y_{11,10}^{(s)}}{32} - \frac{\sqrt{35}Y_{11,2}^{(s)}}{16} - \frac{\sqrt{238}Y_{11,6}^{(s)}}{32} \tag{4270b}$$

$$Y_{11,8}^{(s)} \tag{4271a}$$

$$-\frac{\sqrt{210}Y_{11,10}^{(s)}}{96} + \frac{\sqrt{969}Y_{11,2}^{(s)}}{48} - \frac{\sqrt{570}Y_{11,6}^{(s)}}{32} \tag{4271b}$$

31.3.10 $E : l = 12$

$$\frac{5\sqrt{238051}Y_{12,10}^{(c)}}{3216} - \frac{155\sqrt{134}Y_{12,2}^{(c)}}{3216} + \frac{7\sqrt{23919}Y_{12,6}^{(c)}}{3216} \tag{4272a}$$

$$-\frac{5\sqrt{134134}Y_{12,0}^{(c)}}{6432} - \frac{\sqrt{5475173}Y_{12,12}^{(c)}}{6432} + \frac{3\sqrt{67}Y_{12,4}^{(c)}}{32} + \frac{\sqrt{908922}Y_{12,8}^{(c)}}{2144} \tag{4272b}$$

$$\frac{41\sqrt{938}Y_{12,10}^{(c)}}{3216} + \frac{\sqrt{1666357}Y_{12,2}^{(c)}}{1608} + \frac{5\sqrt{84018}Y_{12,6}^{(c)}}{3216} \tag{4273a}$$

$$-\frac{\sqrt{281333}Y_{12,0}^{(c)}}{804} + \frac{\sqrt{21574}Y_{12,12}^{(c)}}{201} + \frac{\sqrt{2211}Y_{12,8}^{(c)}}{268} \tag{4273b}$$

31.4 T_2

31.4.1 $T_2 : l = 1$

$$Y_{1,1}^{(c)} \tag{4274a}$$

$$-Y_{1,1}^{(s)} \tag{4274b}$$

$$-Y_{1,0}^{(c)} \tag{4274c}$$

31.4.2 $T_2 : l = 2$

$$Y_{2,1}^{(s)} \tag{4275a}$$

$$-Y_{2,1}^{(c)} \tag{4275b}$$

$$-Y_{2,2}^{(s)} \tag{4275c}$$

31.4.3 $T_2 : l = 3$

$$\frac{\sqrt{6}Y_{3,1}^{(c)}}{4} - \frac{\sqrt{10}Y_{3,3}^{(c)}}{4} \tag{4276a}$$

$$-\frac{\sqrt{6}Y_{3,1}^{(s)}}{4} - \frac{\sqrt{10}Y_{3,3}^{(s)}}{4} \tag{4276b}$$

$$Y_{3,0}^{(c)} \tag{4276c}$$

31.4.4 $T_2 : l = 4$

$$-\frac{\sqrt{2}Y_{4,1}^{(s)}}{4} + \frac{\sqrt{14}Y_{4,3}^{(s)}}{4} \tag{4277a}$$

$$\frac{\sqrt{2}Y_{4,1}^{(c)}}{4} + \frac{\sqrt{14}Y_{4,3}^{(c)}}{4} \tag{4277b}$$

$$-Y_{4,2}^{(s)} \tag{4277c}$$

31.4.5 $T_2 : l = 5$

$$\frac{\sqrt{1785}Y_{5,1}^{(c)}}{68} - \frac{3\sqrt{170}Y_{5,3}^{(c)}}{136} + \frac{\sqrt{34}Y_{5,5}^{(c)}}{8} \tag{4278a}$$

$$-\frac{\sqrt{1785}Y_{5,1}^{(s)}}{68} - \frac{3\sqrt{170}Y_{5,3}^{(s)}}{136} - \frac{\sqrt{34}Y_{5,5}^{(s)}}{8} \tag{4278b}$$

$$-\frac{3\sqrt{119}Y_{5,0}^{(c)}}{34} - \frac{\sqrt{85}Y_{5,4}^{(c)}}{34} \tag{4278c}$$

$$-\frac{\sqrt{51}Y_{5,1}^{(c)}}{17} - \frac{\sqrt{238}Y_{5,3}^{(c)}}{17} \tag{4279a}$$

$$\frac{\sqrt{51}Y_{5,1}^{(s)}}{17} - \frac{\sqrt{238}Y_{5,3}^{(s)}}{17} \tag{4279b}$$

$$-\frac{\sqrt{85}Y_{5,0}^{(c)}}{34} + \frac{3\sqrt{119}Y_{5,4}^{(c)}}{34} \tag{4279c}$$

31.4.6 $T_2 : l = 6$

$$-\frac{3\sqrt{85}Y_{6,1}^{(s)}}{68} - \frac{\sqrt{34}Y_{6,3}^{(s)}}{8} + \frac{\sqrt{5610}Y_{6,5}^{(s)}}{136} \tag{4280a}$$

$$\frac{3\sqrt{85}Y_{6,1}^{(c)}}{68} - \frac{\sqrt{34}Y_{6,3}^{(c)}}{8} - \frac{\sqrt{5610}Y_{6,5}^{(c)}}{136} \tag{4280b}$$

$$-\frac{9\sqrt{34}Y_{6,2}^{(s)}}{68} + \frac{\sqrt{1870}Y_{6,6}^{(s)}}{68} \tag{4280c}$$

$$-\frac{\sqrt{187}Y_{6,1}^{(s)}}{17} - \frac{\sqrt{102}Y_{6,5}^{(s)}}{17} \tag{4281a}$$

$$\frac{\sqrt{187}Y_{6,1}^{(c)}}{17} + \frac{\sqrt{102}Y_{6,5}^{(c)}}{17} \tag{4281b}$$

$$\frac{\sqrt{1870}Y_{6,2}^{(s)}}{68} + \frac{9\sqrt{34}Y_{6,6}^{(s)}}{68} \tag{4281c}$$

31.4.7 $T_2 : l = 7$

$$\frac{\sqrt{118}Y_{7,1}^{(c)}}{16} - \frac{9\sqrt{354}Y_{7,3}^{(c)}}{944} - \frac{5\sqrt{3894}Y_{7,5}^{(c)}}{944} - \frac{\sqrt{354354}Y_{7,7}^{(c)}}{944} \tag{4282a}$$

$$-\frac{\sqrt{118}Y_{7,1}^{(s)}}{16} - \frac{9\sqrt{354}Y_{7,3}^{(s)}}{944} + \frac{5\sqrt{3894}Y_{7,5}^{(s)}}{944} - \frac{\sqrt{354354}Y_{7,7}^{(s)}}{944} \tag{4282b}$$

$$\frac{5\sqrt{826}Y_{7,0}^{(c)}}{236} + \frac{3\sqrt{3894}Y_{7,4}^{(c)}}{236} \tag{4282c}$$

$$\frac{\sqrt{9086}Y_{7,3}^{(c)}}{236} - \frac{7\sqrt{826}Y_{7,5}^{(c)}}{236} + \frac{\sqrt{1534}Y_{7,7}^{(c)}}{118} \tag{4283a}$$

$$\frac{\sqrt{9086}Y_{7,3}^{(s)}}{236} + \frac{7\sqrt{826}Y_{7,5}^{(s)}}{236} + \frac{\sqrt{1534}Y_{7,7}^{(s)}}{118} \tag{4283b}$$

$$-\frac{3\sqrt{3894}Y_{7,0}^{(c)}}{236} + \frac{5\sqrt{826}Y_{7,4}^{(c)}}{236} \tag{4283c}$$

31.4.8 $T_2 : l = 8$

$$-\frac{\sqrt{70}Y_{8,1}^{(s)}}{64} + \frac{3\sqrt{66}Y_{8,3}^{(s)}}{64} - \frac{\sqrt{1430}Y_{8,5}^{(s)}}{64} + \frac{\sqrt{2002}Y_{8,7}^{(s)}}{64} \tag{4284a}$$

$$\frac{\sqrt{70}Y_{8,1}^{(c)}}{64} + \frac{3\sqrt{66}Y_{8,3}^{(c)}}{64} + \frac{\sqrt{1430}Y_{8,5}^{(c)}}{64} + \frac{\sqrt{2002}Y_{8,7}^{(c)}}{64} \tag{4284b}$$

$$-Y_{8,2}^{(s)} \tag{4284c}$$

$$-\frac{\sqrt{858}Y_{8,1}^{(s)}}{64} + \frac{\sqrt{910}Y_{8,3}^{(s)}}{64} + \frac{7\sqrt{42}Y_{8,5}^{(s)}}{64} + \frac{3\sqrt{30}Y_{8,7}^{(s)}}{64} \tag{4285a}$$

$$\frac{\sqrt{858}Y_{8,1}^{(c)}}{64} + \frac{\sqrt{910}Y_{8,3}^{(c)}}{64} - \frac{7\sqrt{42}Y_{8,5}^{(c)}}{64} + \frac{3\sqrt{30}Y_{8,7}^{(c)}}{64} \tag{4285b}$$

$$-Y_{8,6}^{(s)} \tag{4285c}$$

31.4.9 $T_2 : l = 9$

$$\frac{3\sqrt{15}Y_{9,1}^{(c)}}{16} + \frac{\sqrt{770}Y_{9,3}^{(c)}}{240} + \frac{\sqrt{858}Y_{9,5}^{(c)}}{144} + \frac{7\sqrt{4290}Y_{9,7}^{(c)}}{1440} + \frac{\sqrt{72930}Y_{9,9}^{(c)}}{480}$$

(4286a)

$$-\frac{3\sqrt{15}Y_{9,1}^{(s)}}{16} + \frac{\sqrt{770}Y_{9,3}^{(s)}}{240} - \frac{\sqrt{858}Y_{9,5}^{(s)}}{144} + \frac{7\sqrt{4290}Y_{9,7}^{(s)}}{1440} - \frac{\sqrt{72930}Y_{9,9}^{(s)}}{480}$$

(4286b)

$$-\frac{7\sqrt{3}Y_{9,0}^{(c)}}{24} - \frac{\sqrt{15015}Y_{9,4}^{(c)}}{180} - \frac{\sqrt{36465}Y_{9,8}^{(c)}}{360}$$

(4286c)

$$\frac{\sqrt{10270}Y_{9,3}^{(c)}}{120} + \frac{31\sqrt{3318}Y_{9,5}^{(c)}}{5688} + \frac{41\sqrt{16590}Y_{9,7}^{(c)}}{28440} - \frac{7\sqrt{282030}Y_{9,9}^{(c)}}{9480}$$

(4287a)

$$\frac{\sqrt{10270}Y_{9,3}^{(s)}}{120} - \frac{31\sqrt{3318}Y_{9,5}^{(s)}}{5688} + \frac{41\sqrt{16590}Y_{9,7}^{(s)}}{28440} + \frac{7\sqrt{282030}Y_{9,9}^{(s)}}{9480}$$

(4287b)

$$\frac{\sqrt{237237}Y_{9,0}^{(c)}}{948} + \frac{53\sqrt{1185}Y_{9,4}^{(c)}}{7110} - \frac{31\sqrt{141015}Y_{9,8}^{(c)}}{14220}$$

(4287c)

$$\frac{\sqrt{2686}Y_{9,5}^{(c)}}{79} - \frac{\sqrt{13430}Y_{9,7}^{(c)}}{158} + \frac{\sqrt{790}Y_{9,9}^{(c)}}{158}$$

(4288a)

$$-\frac{\sqrt{2686}Y_{9,5}^{(s)}}{79} - \frac{\sqrt{13430}Y_{9,7}^{(s)}}{158} - \frac{\sqrt{790}Y_{9,9}^{(s)}}{158}$$

(4288b)

$$-\frac{\sqrt{192049}Y_{9,0}^{(c)}}{632} + \frac{\sqrt{47005}Y_{9,4}^{(c)}}{316} - \frac{7\sqrt{395}Y_{9,8}^{(c)}}{632}$$

(4288c)

31.4.10 $T_2 : l = 10$

$$-\frac{\sqrt{191}Y_{10,1}^{(s)}}{16} - \frac{7\sqrt{14898}Y_{10,3}^{(s)}}{3056} - \frac{3\sqrt{74490}Y_{10,5}^{(s)}}{3056} - \frac{3\sqrt{253266}Y_{10,7}^{(s)}}{6112} - \frac{\sqrt{1604018}Y_{10,9}^{(s)}}{6112}$$

(4289a)

$$\frac{\sqrt{191}Y_{10,1}^{(c)}}{16} - \frac{7\sqrt{14898}Y_{10,3}^{(c)}}{3056} + \frac{3\sqrt{74490}Y_{10,5}^{(c)}}{3056} - \frac{3\sqrt{253266}Y_{10,7}^{(c)}}{6112} + \frac{\sqrt{1604018}Y_{10,9}^{(c)}}{6112}$$

(4289b)

$$\frac{\sqrt{8020090}Y_{10,10}^{(s)}}{3056} + \frac{7\sqrt{573}Y_{10,2}^{(s)}}{1528} + \frac{9\sqrt{14898}Y_{10,6}^{(s)}}{3056}$$

(4289c)

$$-\frac{\sqrt{1367942}Y_{10,3}^{(s)}}{1528} + \frac{157\sqrt{6839710}Y_{10,5}^{(s)}}{5471768} + \frac{365\sqrt{23255014}Y_{10,7}^{(s)}}{5471768} + \frac{83\sqrt{1325535798}Y_{10,9}^{(s)}}{5471768}$$

(4290a)

$$-\frac{\sqrt{1367942}Y_{10,3}^{(c)}}{1528} - \frac{157\sqrt{6839710}Y_{10,5}^{(c)}}{5471768} + \frac{365\sqrt{23255014}Y_{10,7}^{(c)}}{5471768} - \frac{83\sqrt{1325535798}Y_{10,9}^{(c)}}{5471768}$$

(4290b)

$$\frac{25\sqrt{6627678990}Y_{10,10}^{(s)}}{5471768} - \frac{371\sqrt{8891623}Y_{10,2}^{(s)}}{2735884} - \frac{3909\sqrt{1367942}Y_{10,6}^{(s)}}{5471768}$$

(4290c)

$$-\frac{\sqrt{2313326}Y_{10,5}^{(s)}}{3581} + \frac{7\sqrt{680390}Y_{10,7}^{(s)}}{7162} - \frac{9\sqrt{107430}Y_{10,9}^{(s)}}{7162}$$

(4291a)

$$\frac{\sqrt{2313326}Y_{10,5}^{(c)}}{3581} + \frac{7\sqrt{680390}Y_{10,7}^{(c)}}{7162} + \frac{9\sqrt{107430}Y_{10,9}^{(c)}}{7162}$$

(4291b)

$$\frac{21\sqrt{21486}Y_{10,10}^{(s)}}{57296} + \frac{3\sqrt{75183095}Y_{10,2}^{(s)}}{28648} - \frac{7\sqrt{11566630}Y_{10,6}^{(s)}}{57296}$$

(4291c)

31.4.11 $T_2 : l = 11$

$$-\frac{\sqrt{88179}Y_{11,11}^{(c)}}{512} + \frac{21\sqrt{66}Y_{11,1}^{(c)}}{512} - \frac{\sqrt{30030}Y_{11,3}^{(c)}}{512} + \frac{15\sqrt{143}Y_{11,5}^{(c)}}{512} - \frac{\sqrt{36465}Y_{11,7}^{(c)}}{512} + \frac{\sqrt{46189}Y_{11,9}^{(c)}}{512}$$

(4292a)

$$-\frac{\sqrt{88179}Y_{11,11}^{(s)}}{512} - \frac{21\sqrt{66}Y_{11,1}^{(s)}}{512} - \frac{\sqrt{30030}Y_{11,3}^{(s)}}{512} - \frac{15\sqrt{143}Y_{11,5}^{(s)}}{512} - \frac{\sqrt{36465}Y_{11,7}^{(s)}}{512} - \frac{\sqrt{46189}Y_{11,9}^{(s)}}{512}$$

(4292b)

$$Y_{11,0}^{(c)}$$

(4292c)

$$\frac{1357\sqrt{2674749}Y_{11,11}^{(c)}}{5928448} - \frac{205\sqrt{291721326}Y_{11,1}^{(c)}}{5928448} + \frac{5\sqrt{785403570}Y_{11,3}^{(c)}}{5928448} + \frac{949\sqrt{3740017}Y_{11,5}^{(c)}}{5928448} - \frac{427\sqrt{3300015}Y_{11,7}^{(c)}}{5928448} + \frac{3\sqrt{11579}Y_{11,9}^{(c)}}{512}$$

(4293a)

$$\frac{1357\sqrt{2674749}Y_{11,11}^{(s)}}{5928448} + \frac{205\sqrt{291721326}Y_{11,1}^{(s)}}{5928448} + \frac{5\sqrt{785403570}Y_{11,3}^{(s)}}{5928448} - \frac{949\sqrt{3740017}Y_{11,5}^{(s)}}{5928448} - \frac{427\sqrt{3300015}Y_{11,7}^{(s)}}{5928448} - \frac{3\sqrt{11579}Y_{11,9}^{(s)}}{512}$$

(4293b)

$$-\frac{2\sqrt{26180119}Y_{11,4}^{(c)}}{11579} - \frac{13\sqrt{173685}Y_{11,8}^{(c)}}{11579}$$

(4293c)

$$\frac{\sqrt{205700935}Y_{11,11}^{(c)}}{92632} + \frac{\sqrt{10536890}Y_{11,1}^{(c)}}{23158} + \frac{279\sqrt{23158}Y_{11,3}^{(c)}}{92632} - \frac{25\sqrt{1215795}Y_{11,5}^{(c)}}{92632} - \frac{8\sqrt{1377901}Y_{11,7}^{(c)}}{11579}$$

(4294a)

$$\frac{\sqrt{205700935}Y_{11,11}^{(s)}}{92632} - \frac{\sqrt{10536890}Y_{11,1}^{(s)}}{23158} + \frac{279\sqrt{23158}Y_{11,3}^{(s)}}{92632} + \frac{25\sqrt{1215795}Y_{11,5}^{(s)}}{92632} - \frac{8\sqrt{1377901}Y_{11,7}^{(s)}}{11579}$$

(4294b)

$$-\frac{13\sqrt{173685}Y_{11,4}^{(c)}}{11579} + \frac{2\sqrt{26180119}Y_{11,8}^{(c)}}{11579}$$

(4294c)

31.4.12 $T_2 : l = 12$

$$\frac{\sqrt{164255190}Y_{12,11}^{(s)}}{21440} - \frac{3\sqrt{77385}Y_{12,1}^{(s)}}{2144} + \frac{\sqrt{335}Y_{12,3}^{(s)}}{32} - \frac{27\sqrt{11390}Y_{12,5}^{(s)}}{21440} + \frac{\sqrt{4544610}Y_{12,7}^{(s)}}{21440} + \frac{17\sqrt{216410}Y_{12,9}^{(s)}}{21440}$$

(4295a)

$$\frac{\sqrt{164255190}Y_{12,11}^{(c)}}{21440} + \frac{3\sqrt{77385}Y_{12,1}^{(c)}}{2144} + \frac{\sqrt{335}Y_{12,3}^{(c)}}{32} + \frac{27\sqrt{11390}Y_{12,5}^{(c)}}{21440} + \frac{\sqrt{4544610}Y_{12,7}^{(c)}}{21440} - \frac{17\sqrt{216410}Y_{12,9}^{(c)}}{21440}$$

(4295b)

$$-\frac{\sqrt{3570765}Y_{12,10}^{(s)}}{5360} - \frac{9\sqrt{2010}Y_{12,2}^{(s)}}{1072} - \frac{23\sqrt{39865}Y_{12,6}^{(s)}}{5360}$$

(4295c)

$$-\frac{1123\sqrt{1157306410}Y_{12,11}^{(s)}}{201270680} - \frac{59\sqrt{56884125935}Y_{12,1}^{(s)}}{40254136} - \frac{853\sqrt{31549179090}Y_{12,5}^{(s)}}{201270680} + \frac{3359\sqrt{3874460590}Y_{12,7}^{(s)}}{402541360} + \frac{721\sqrt{1660483110}Y_{12,9}^{(s)}}{402541360}$$

(4296a)

$$-\frac{1123\sqrt{1157306410}Y_{12,11}^{(c)}}{201270680} + \frac{59\sqrt{56884125935}Y_{12,1}^{(c)}}{40254136} - \frac{853\sqrt{31549179090}Y_{12,5}^{(c)}}{201270680} + \frac{3359\sqrt{3874460590}Y_{12,7}^{(c)}}{402541360} - \frac{721\sqrt{1660483110}Y_{12,9}^{(c)}}{402541360}$$

(4296b)

$$-\frac{\sqrt{25158835}Y_{12,10}^{(s)}}{5360} + \frac{27\sqrt{178778681510}Y_{12,2}^{(s)}}{80508272} + \frac{391\sqrt{110422126815}Y_{12,6}^{(s)}}{402541360}$$

(4296c)

$$\frac{\sqrt{2527073549}Y_{12,11}^{(s)}}{150202} + \frac{3\sqrt{28087774}Y_{12,1}^{(s)}}{600808} - \frac{25\sqrt{1577121}Y_{12,5}^{(s)}}{150202} + \frac{275\sqrt{1426919}Y_{12,7}^{(s)}}{600808} - \frac{81\sqrt{29965299}Y_{12,9}^{(s)}}{600808}$$

(4297a)

$$\frac{\sqrt{2527073549}Y_{12,11}^{(c)}}{150202} - \frac{3\sqrt{28087774}Y_{12,1}^{(c)}}{600808} + \frac{25\sqrt{1577121}Y_{12,5}^{(c)}}{150202} + \frac{275\sqrt{1426919}Y_{12,7}^{(c)}}{600808} + \frac{81\sqrt{29965299}Y_{12,9}^{(c)}}{600808}$$

(4297b)

$$-\frac{23\sqrt{8937019}Y_{12,2}^{(s)}}{75101} + \frac{45\sqrt{450606}Y_{12,6}^{(s)}}{75101}$$

(4297c)

31.5 T_1

31.5.1 $T_1 : l = 3$

$$\frac{\sqrt{10}Y_{3,1}^{(c)}}{4} + \frac{\sqrt{6}Y_{3,3}^{(c)}}{4} \tag{4298a}$$

$$\frac{\sqrt{10}Y_{3,1}^{(s)}}{4} - \frac{\sqrt{6}Y_{3,3}^{(s)}}{4} \tag{4298b}$$

$$Y_{3,2}^{(c)} \tag{4298c}$$

31.5.2 $T_1 : l = 4$

$$-\frac{\sqrt{14}Y_{4,1}^{(s)}}{4} - \frac{\sqrt{2}Y_{4,3}^{(s)}}{4} \tag{4299a}$$

$$-\frac{\sqrt{14}Y_{4,1}^{(c)}}{4} + \frac{\sqrt{2}Y_{4,3}^{(c)}}{4} \tag{4299b}$$

$$-Y_{4,4}^{(s)} \tag{4299c}$$

31.5.3 $T_1 : l = 5$

$$\frac{\sqrt{7}Y_{5,1}^{(c)}}{4} - \frac{\sqrt{6}Y_{5,3}^{(c)}}{8} - \frac{\sqrt{30}Y_{5,5}^{(c)}}{8} \tag{4300a}$$

$$\frac{\sqrt{7}Y_{5,1}^{(s)}}{4} + \frac{\sqrt{6}Y_{5,3}^{(s)}}{8} - \frac{\sqrt{30}Y_{5,5}^{(s)}}{8} \tag{4300b}$$

$$-Y_{5,2}^{(c)} \tag{4300c}$$

31.5.4 $T_1 : l = 6$

$$\frac{\sqrt{3}Y_{6,1}^{(s)}}{4} - \frac{\sqrt{30}Y_{6,3}^{(s)}}{8} - \frac{\sqrt{22}Y_{6,5}^{(s)}}{8} \tag{4301a}$$

$$\frac{\sqrt{3}Y_{6,1}^{(c)}}{4} + \frac{\sqrt{30}Y_{6,3}^{(c)}}{8} - \frac{\sqrt{22}Y_{6,5}^{(c)}}{8} \tag{4301b}$$

$$-Y_{6,4}^{(s)} \tag{4301c}$$

31.5.5 $T_1 : l = 7$

$$\frac{\sqrt{858}Y_{7,1}^{(c)}}{64} + \frac{3\sqrt{286}Y_{7,3}^{(c)}}{64} + \frac{5\sqrt{26}Y_{7,5}^{(c)}}{64} + \frac{\sqrt{14}Y_{7,7}^{(c)}}{64} \tag{4302a}$$

$$\frac{\sqrt{858}Y_{7,1}^{(s)}}{64} - \frac{3\sqrt{286}Y_{7,3}^{(s)}}{64} + \frac{5\sqrt{26}Y_{7,5}^{(s)}}{64} - \frac{\sqrt{14}Y_{7,7}^{(s)}}{64} \tag{4302b}$$

$$Y_{7,6}^{(c)} \tag{4302c}$$

$$-\frac{15\sqrt{6}Y_{7,1}^{(c)}}{64} + \frac{19\sqrt{2}Y_{7,3}^{(c)}}{64} - \frac{\sqrt{22}Y_{7,5}^{(c)}}{64} - \frac{\sqrt{2002}Y_{7,7}^{(c)}}{64} \tag{4303a}$$

$$-\frac{15\sqrt{6}Y_{7,1}^{(s)}}{64} - \frac{19\sqrt{2}Y_{7,3}^{(s)}}{64} - \frac{\sqrt{22}Y_{7,5}^{(s)}}{64} + \frac{\sqrt{2002}Y_{7,7}^{(s)}}{64} \tag{4303b}$$

$$-Y_{7,2}^{(c)} \tag{4303c}$$

31.5.6 $T_1 : l = 8$

$$\frac{3\sqrt{22}Y_{8,1}^{(s)}}{16} + \frac{\sqrt{210}Y_{8,3}^{(s)}}{48} + \frac{\sqrt{182}Y_{8,5}^{(s)}}{48} + \frac{\sqrt{130}Y_{8,7}^{(s)}}{48} \tag{4304a}$$

$$\frac{3\sqrt{22}Y_{8,1}^{(c)}}{16} - \frac{\sqrt{210}Y_{8,3}^{(c)}}{48} + \frac{\sqrt{182}Y_{8,5}^{(c)}}{48} - \frac{\sqrt{130}Y_{8,7}^{(c)}}{48} \tag{4304b}$$

$$\frac{\sqrt{14}Y_{8,4}^{(s)}}{12} + \frac{\sqrt{130}Y_{8,8}^{(s)}}{12} \tag{4304c}$$

$$\frac{\sqrt{78}Y_{8,3}^{(s)}}{12} - \frac{\sqrt{10}Y_{8,5}^{(s)}}{12} - \frac{\sqrt{14}Y_{8,7}^{(s)}}{6} \tag{4305a}$$

$$-\frac{\sqrt{78}Y_{8,3}^{(c)}}{12} - \frac{\sqrt{10}Y_{8,5}^{(c)}}{12} + \frac{\sqrt{14}Y_{8,7}^{(c)}}{6} \tag{4305b}$$

$$-\frac{\sqrt{130}Y_{8,4}^{(s)}}{12} + \frac{\sqrt{14}Y_{8,8}^{(s)}}{12} \tag{4305c}$$

31.5.7 $T_1 : l = 9$

$$-\frac{7\sqrt{22}Y_{9,1}^{(c)}}{64} + \frac{3\sqrt{21}Y_{9,3}^{(c)}}{32} - \frac{\sqrt{65}Y_{9,5}^{(c)}}{32} - \frac{\sqrt{13}Y_{9,7}^{(c)}}{64} + \frac{3\sqrt{221}Y_{9,9}^{(c)}}{64} \tag{4306a}$$

$$-\frac{7\sqrt{22}Y_{9,1}^{(s)}}{64} - \frac{3\sqrt{21}Y_{9,3}^{(s)}}{32} - \frac{\sqrt{65}Y_{9,5}^{(s)}}{32} + \frac{\sqrt{13}Y_{9,7}^{(s)}}{64} + \frac{3\sqrt{221}Y_{9,9}^{(s)}}{64} \tag{4306b}$$

$$Y_{9,2}^{(c)} \tag{4306c}$$

$$-\frac{\sqrt{858}Y_{9,1}^{(c)}}{64} - \frac{\sqrt{91}Y_{9,3}^{(c)}}{32} + \frac{5\sqrt{15}Y_{9,5}^{(c)}}{32} + \frac{21\sqrt{3}Y_{9,7}^{(c)}}{64} + \frac{\sqrt{51}Y_{9,9}^{(c)}}{64} \tag{4307a}$$

$$-\frac{\sqrt{858}Y_{9,1}^{(s)}}{64} + \frac{\sqrt{91}Y_{9,3}^{(s)}}{32} + \frac{5\sqrt{15}Y_{9,5}^{(s)}}{32} - \frac{21\sqrt{3}Y_{9,7}^{(s)}}{64} + \frac{\sqrt{51}Y_{9,9}^{(s)}}{64} \tag{4307b}$$

$$Y_{9,6}^{(c)} \tag{4307c}$$

31.5.8 $T_1 : l = 10$

$$-\frac{\sqrt{65}Y_{10,1}^{(s)}}{16} + \frac{7\sqrt{30}Y_{10,3}^{(s)}}{80} + \frac{3\sqrt{6}Y_{10,5}^{(s)}}{16} + \frac{3\sqrt{510}Y_{10,7}^{(s)}}{160} + \frac{\sqrt{3230}Y_{10,9}^{(s)}}{160} \tag{4308a}$$

$$-\frac{\sqrt{65}Y_{10,1}^{(c)}}{16} - \frac{7\sqrt{30}Y_{10,3}^{(c)}}{80} + \frac{3\sqrt{6}Y_{10,5}^{(c)}}{16} - \frac{3\sqrt{510}Y_{10,7}^{(c)}}{160} + \frac{\sqrt{3230}Y_{10,9}^{(c)}}{160} \tag{4308b}$$

$$\frac{\sqrt{15}Y_{10,4}^{(s)}}{10} + \frac{\sqrt{85}Y_{10,8}^{(s)}}{10} \tag{4308c}$$

$$\frac{\sqrt{170}Y_{10,3}^{(s)}}{40} - \frac{\sqrt{34}Y_{10,5}^{(s)}}{8} - \frac{\sqrt{10}Y_{10,7}^{(s)}}{40} + \frac{\sqrt{570}Y_{10,9}^{(s)}}{40} \tag{4309a}$$

$$-\frac{\sqrt{170}Y_{10,3}^{(c)}}{40} - \frac{\sqrt{34}Y_{10,5}^{(c)}}{8} + \frac{\sqrt{10}Y_{10,7}^{(c)}}{40} + \frac{\sqrt{570}Y_{10,9}^{(c)}}{40} \tag{4309b}$$

$$\frac{\sqrt{85}Y_{10,4}^{(s)}}{10} - \frac{\sqrt{15}Y_{10,8}^{(s)}}{10} \tag{4309c}$$

31.5.9 $T_1 : l = 11$

$$-\frac{\sqrt{44814}Y_{11,11}^{(c)}}{18624} - \frac{\sqrt{1221909}Y_{11,1}^{(c)}}{3104} - \frac{\sqrt{3289755}Y_{11,3}^{(c)}}{9312} + \frac{13\sqrt{62662}Y_{11,5}^{(c)}}{6208} - \frac{29\sqrt{55290}Y_{11,7}^{(c)}}{18624} - \frac{3\sqrt{194}Y_{11,9}^{(c)}}{64} \tag{4310a}$$

$$\frac{\sqrt{44814}Y_{11,11}^{(s)}}{18624} - \frac{\sqrt{1221909}Y_{11,1}^{(s)}}{3104} + \frac{\sqrt{3289755}Y_{11,3}^{(s)}}{9312} + \frac{13\sqrt{62662}Y_{11,5}^{(s)}}{6208} + \frac{29\sqrt{55290}Y_{11,7}^{(s)}}{18624} - \frac{3\sqrt{194}Y_{11,9}^{(s)}}{64} \tag{4310b}$$

$$-\frac{3\sqrt{2037}Y_{11,10}^{(c)}}{1552} + \frac{\sqrt{939930}Y_{11,2}^{(c)}}{4656} - \frac{61\sqrt{5529}Y_{11,6}^{(c)}}{4656} \tag{4310c}$$

$$-\frac{5\sqrt{4257330}Y_{11,11}^{(c)}}{51216} + \frac{\sqrt{321555}Y_{11,1}^{(c)}}{4268} + \frac{107\sqrt{34629}Y_{11,3}^{(c)}}{25608} + \frac{71\sqrt{16490}Y_{11,5}^{(c)}}{17072} + \frac{11\sqrt{582}Y_{11,7}^{(c)}}{1164} \tag{4311a}$$

$$\frac{5\sqrt{4257330}Y_{11,11}^{(s)}}{51216} + \frac{\sqrt{321555}Y_{11,1}^{(s)}}{4268} - \frac{107\sqrt{34629}Y_{11,3}^{(s)}}{25608} + \frac{71\sqrt{16490}Y_{11,5}^{(s)}}{17072} - \frac{11\sqrt{582}Y_{11,7}^{(s)}}{1164} \tag{4311b}$$

$$\frac{37\sqrt{193515}Y_{11,10}^{(c)}}{17072} - \frac{137\sqrt{9894}Y_{11,2}^{(c)}}{51216} - \frac{191\sqrt{1455}Y_{11,6}^{(c)}}{51216} \tag{4311c}$$

$$\frac{\sqrt{3553}Y_{11,11}^{(c)}}{88} + \frac{\sqrt{182}Y_{11,1}^{(c)}}{22} - \frac{5\sqrt{10}Y_{11,3}^{(c)}}{88} + \frac{7\sqrt{21}Y_{11,5}^{(c)}}{88} \tag{4312a}$$

$$-\frac{\sqrt{3553}Y_{11,11}^{(s)}}{88} + \frac{\sqrt{182}Y_{11,1}^{(s)}}{22} + \frac{5\sqrt{10}Y_{11,3}^{(s)}}{88} + \frac{7\sqrt{21}Y_{11,5}^{(s)}}{88} \tag{4312b}$$

$$\frac{\sqrt{646}Y_{11,10}^{(c)}}{88} + \frac{7\sqrt{35}Y_{11,2}^{(c)}}{44} + \frac{\sqrt{238}Y_{11,6}^{(c)}}{88} \tag{4312c}$$

31.5.10 $T_1 : l = 12$

$$\frac{3\sqrt{976074}Y_{12,11}^{(s)}}{41152} + \frac{\sqrt{47976159}Y_{12,1}^{(s)}}{20576} - \frac{17\sqrt{207689}Y_{12,3}^{(s)}}{20576} - \frac{75\sqrt{24434}Y_{12,5}^{(s)}}{41152} + \frac{147\sqrt{27006}Y_{12,7}^{(s)}}{41152} + \frac{\sqrt{1286}Y_{12,9}^{(s)}}{64} \tag{4313a}$$

$$-\frac{3\sqrt{976074}Y_{12,11}^{(c)}}{41152} + \frac{\sqrt{47976159}Y_{12,1}^{(c)}}{20576} + \frac{17\sqrt{207689}Y_{12,3}^{(c)}}{20576} - \frac{75\sqrt{24434}Y_{12,5}^{(c)}}{41152} - \frac{147\sqrt{27006}Y_{12,7}^{(c)}}{41152} + \frac{\sqrt{1286}Y_{12,9}^{(c)}}{64} \tag{4313b}$$

$$\frac{\sqrt{162679}Y_{12,12}^{(s)}}{10288} - \frac{3\sqrt{207689}Y_{12,4}^{(s)}}{10288} + \frac{31\sqrt{27006}Y_{12,8}^{(s)}}{5144} \tag{4313c}$$

$$-\frac{215\sqrt{3663560658}Y_{12,11}^{(s)}}{22355824} - \frac{145\sqrt{498814323}Y_{12,1}^{(s)}}{5588956} + \frac{39\sqrt{261283693}Y_{12,3}^{(s)}}{11177912} - \frac{\sqrt{30739258}Y_{12,5}^{(s)}}{10288} + \frac{9\sqrt{12264963942}Y_{12,7}^{(s)}}{5588956} \tag{4314a}$$

$$\frac{215\sqrt{3663560658}Y_{12,11}^{(c)}}{22355824} - \frac{145\sqrt{498814323}Y_{12,1}^{(c)}}{5588956} - \frac{39\sqrt{261283693}Y_{12,3}^{(c)}}{11177912} - \frac{\sqrt{30739258}Y_{12,5}^{(c)}}{10288} - \frac{9\sqrt{12264963942}Y_{12,7}^{(c)}}{5588956} \tag{4314b}$$

$$-\frac{501\sqrt{610593443}Y_{12,12}^{(c)}}{22355824} - \frac{1145\sqrt{261283693}Y_{12,4}^{(s)}}{22355824} - \frac{9\sqrt{12264963942}Y_{12,8}^{(s)}}{11177912} \tag{4314c}$$

$$\frac{\sqrt{2844457}Y_{12,11}^{(s)}}{4346} - \frac{\sqrt{20891222}Y_{12,1}^{(s)}}{8692} - \frac{\sqrt{39883242}Y_{12,3}^{(s)}}{8692} - \frac{\sqrt{849643}Y_{12,7}^{(s)}}{4346} \tag{4315a}$$

$$-\frac{\sqrt{2844457}Y_{12,11}^{(c)}}{4346} - \frac{\sqrt{20891222}Y_{12,1}^{(c)}}{8692} + \frac{\sqrt{39883242}Y_{12,3}^{(c)}}{8692} + \frac{\sqrt{849643}Y_{12,7}^{(c)}}{4346} \tag{4315b}$$

$$-\frac{7\sqrt{17066742}Y_{12,12}^{(s)}}{34768} + \frac{3\sqrt{39883242}Y_{12,4}^{(s)}}{34768} + \frac{\sqrt{849643}Y_{12,8}^{(s)}}{8692} \tag{4315c}$$

32   Group O_h

32.1 A_{1g}

32.1.1 $A_{1g} : l = 0$

$$Y_{0,0}^{(c)}$$

(4316a)

32.1.2 $A_{1g} : l = 4$

$$\frac{\sqrt{21}Y_{4,0}^{(c)}}{6} + \frac{\sqrt{15}Y_{4,4}^{(c)}}{6}$$

(4317a)

32.1.3 $A_{1g} : l = 6$

$$-\frac{\sqrt{2}Y_{6,0}^{(c)}}{4} + \frac{\sqrt{14}Y_{6,4}^{(c)}}{4}$$

(4318a)

32.1.4 $A_{1g} : l = 8$

$$\frac{\sqrt{33}Y_{8,0}^{(c)}}{8} + \frac{\sqrt{21}Y_{8,4}^{(c)}}{12} + \frac{\sqrt{195}Y_{8,8}^{(c)}}{24}$$

(4319a)

32.1.5 $A_{1g} : l = 10$

$$\frac{\sqrt{390}Y_{10,0}^{(c)}}{48} - \frac{\sqrt{22}Y_{10,4}^{(c)}}{8} - \frac{\sqrt{1122}Y_{10,8}^{(c)}}{48}$$

(4320a)

32.1.6 $A_{1g} : l = 12$

$$\frac{\sqrt{4458}Y_{12,0}^{(c)}}{96} + \frac{\sqrt{1506890931}Y_{12,12}^{(c)}}{71328} + \frac{5\sqrt{2231229}Y_{12,4}^{(c)}}{23776} + \frac{\sqrt{68636854}Y_{12,8}^{(c)}}{23776}$$

(4321a)

$$-\frac{9\sqrt{16346}Y_{12,12}^{(c)}}{5944} - \frac{\sqrt{11039494}Y_{12,4}^{(c)}}{5944} + \frac{\sqrt{358869}Y_{12,8}^{(c)}}{743}$$

(4322a)

32.2 A_{2u}

32.2.1 $A_{2u} : l = 3$

$$-Y_{3,2}^{(s)}$$

(4323a)

32.2.2 $A_{2u} : l = 7$

$$-\frac{\sqrt{78}Y_{7,2}^{(s)}}{12} - \frac{\sqrt{66}Y_{7,6}^{(s)}}{12}$$

(4324a)

32.2.3 $A_{2u} : l = 9$

$$\frac{\sqrt{3}Y_{9,2}^{(s)}}{4} - \frac{\sqrt{13}Y_{9,6}^{(s)}}{4}$$

(4325a)

32.2.4 $A_{2u} : l = 11$

$$-\frac{\sqrt{798}Y_{11,10}^{(s)}}{48} - \frac{\sqrt{255}Y_{11,2}^{(s)}}{24} - \frac{3\sqrt{6}Y_{11,6}^{(s)}}{16}$$

(4326a)

32.3 A_{1u}

32.3.1 $A_{1u} : l = 9$

$$-\frac{\sqrt{102}Y_{9,4}^{(s)}}{12} + \frac{\sqrt{42}Y_{9,8}^{(s)}}{12}$$

(4327a)

32.4 A_{2g}

32.4.1 $A_{2g} : l = 6$

$$\frac{\sqrt{11}Y_{6,2}^{(c)}}{4} - \frac{\sqrt{5}Y_{6,6}^{(c)}}{4}$$

(4328a)

32.4.2 $A_{2g} : l = 10$

$$-\frac{\sqrt{85}Y_{10,10}^{(c)}}{16} + \frac{\sqrt{1482}Y_{10,2}^{(c)}}{48} + \frac{\sqrt{57}Y_{10,6}^{(c)}}{48}$$

(4329a)

32.4.3 $A_{2g} : l = 12$

$$\frac{\sqrt{627}Y_{12,10}^{(c)}}{48} + \frac{\sqrt{102}Y_{12,2}^{(c)}}{48} - \frac{5\sqrt{7}Y_{12,6}^{(c)}}{16}$$

(4330a)

32.5 E_u

32.5.1 $E_u : l = 5$

$$Y_{5,4}^{(s)}$$

(4331a)

$$Y_{5,2}^{(s)}$$

(4331b)

32.5.2 $E_u : l = 7$

$$Y_{7,4}^{(s)} \tag{4332a}$$

$$-\frac{\sqrt{66}Y_{7,2}^{(s)}}{12} + \frac{\sqrt{78}Y_{7,6}^{(s)}}{12} \tag{4332b}$$

32.5.3 $E_u : l = 9$

$$\frac{\sqrt{13}Y_{9,2}^{(s)}}{4} + \frac{\sqrt{3}Y_{9,6}^{(s)}}{4} \tag{4333a}$$

$$\frac{\sqrt{42}Y_{9,4}^{(s)}}{12} + \frac{\sqrt{102}Y_{9,8}^{(s)}}{12} \tag{4333b}$$

32.5.4 $E_u : l = 11$

$$-\frac{\sqrt{12019}Y_{11,4}^{(s)}}{202} + \frac{\sqrt{28785}Y_{11,8}^{(s)}}{202} \tag{4334a}$$

$$\frac{3\sqrt{26866}Y_{11,10}^{(s)}}{1616} + \frac{3\sqrt{8585}Y_{11,2}^{(s)}}{808} - \frac{\sqrt{202}Y_{11,6}^{(s)}}{16} \tag{4334b}$$

$$-\frac{\sqrt{51510}Y_{11,10}^{(s)}}{303} + \frac{\sqrt{40299}Y_{11,2}^{(s)}}{303} \tag{4335a}$$

$$\frac{\sqrt{28785}Y_{11,4}^{(s)}}{202} + \frac{\sqrt{12019}Y_{11,8}^{(s)}}{202} \tag{4335b}$$

32.6 E_g

32.6.1 $E_g : l = 2$

$$Y_{2,2}^{(c)} \tag{4336a}$$

$$Y_{2,0}^{(c)} \tag{4336b}$$

32.6.2 $E_g : l = 4$

$$Y_{4,2}^{(c)} \tag{4337a}$$

$$\frac{\sqrt{15}Y_{4,0}^{(c)}}{6} - \frac{\sqrt{21}Y_{4,4}^{(c)}}{6} \tag{4337b}$$

32.6.3 $E_g : l = 6$

$$\frac{\sqrt{14}Y_{6,0}^{(c)}}{4} + \frac{\sqrt{2}Y_{6,4}^{(c)}}{4} \tag{4338a}$$

$$\frac{\sqrt{5}Y_{6,2}^{(c)}}{4} + \frac{\sqrt{11}Y_{6,6}^{(c)}}{4} \tag{4338b}$$

32.6.4 $E_g : l = 8$

$$Y_{8,6}^{(c)} \tag{4339a}$$

$$\frac{\sqrt{286}Y_{8,0}^{(c)}}{32} - \frac{\sqrt{182}Y_{8,4}^{(c)}}{16} - \frac{\sqrt{10}Y_{8,8}^{(c)}}{32} \tag{4339b}$$

$$Y_{8,2}^{(c)} \tag{4340a}$$

$$\frac{\sqrt{210}Y_{8,0}^{(c)}}{32} + \frac{\sqrt{330}Y_{8,4}^{(c)}}{48} - \frac{\sqrt{6006}Y_{8,8}^{(c)}}{96} \tag{4340b}$$

32.6.5 $E_g : l = 10$

$$\frac{\sqrt{2876315}Y_{10,10}^{(c)}}{2192} + \frac{\sqrt{822}Y_{10,2}^{(c)}}{48} - \frac{19\sqrt{5343}Y_{10,6}^{(c)}}{6576} \tag{4341a}$$

$$-\frac{7\sqrt{45210}Y_{10,0}^{(c)}}{2192} - \frac{13\sqrt{3562}Y_{10,4}^{(c)}}{1096} + \frac{\sqrt{181662}Y_{10,8}^{(c)}}{2192} \tag{4341b}$$

$$\frac{\sqrt{5206}Y_{10,10}^{(c)}}{274} + \frac{\sqrt{69870}Y_{10,6}^{(c)}}{274} \tag{4342a}$$

$$\frac{\sqrt{999141}Y_{10,0}^{(c)}}{1644} - \frac{\sqrt{11645}Y_{10,4}^{(c)}}{274} + \frac{25\sqrt{2055}Y_{10,8}^{(c)}}{1644} \tag{4342b}$$

32.6.6 $E_g : l = 12$

$$\frac{\sqrt{413763}Y_{12,10}^{(c)}}{976} + \frac{3\sqrt{28182}Y_{12,2}^{(c)}}{976} + \frac{5\sqrt{11407}Y_{12,6}^{(c)}}{976} \tag{4343a}$$

$$-\frac{\sqrt{4758}Y_{12,0}^{(c)}}{96} + \frac{\sqrt{9516549}Y_{12,12}^{(c)}}{5856} + \frac{5\sqrt{14091}Y_{12,4}^{(c)}}{1952} + \frac{\sqrt{433466}Y_{12,8}^{(c)}}{1952} \tag{4343b}$$

$$\frac{25\sqrt{4026}Y_{12,10}^{(c)}}{2928} - \frac{5\sqrt{59109}Y_{12,2}^{(c)}}{1464} + \frac{\sqrt{16226}Y_{12,6}^{(c)}}{976} \tag{4344a}$$

$$-\frac{\sqrt{92598}Y_{12,12}^{(c)}}{488} + \frac{\sqrt{118218}Y_{12,4}^{(c)}}{488} + \frac{\sqrt{427}Y_{12,8}^{(c)}}{61} \tag{4344b}$$

32.7 T_{1g}

32.7.1 $T_{1g} : l = 4$

$$-\frac{\sqrt{14}Y_{4,1}^{(s)}}{4} - \frac{\sqrt{2}Y_{4,3}^{(s)}}{4} \tag{4345a}$$

$$-\frac{\sqrt{14}Y_{4,1}^{(c)}}{4} + \frac{\sqrt{2}Y_{4,3}^{(c)}}{4} \tag{4345b}$$

$$-Y_{4,4}^{(s)} \tag{4345c}$$

32.7.2 $T_{1g} : l = 6$

$$\frac{\sqrt{3}Y_{6,1}^{(s)}}{4} - \frac{\sqrt{30}Y_{6,3}^{(s)}}{8} - \frac{\sqrt{22}Y_{6,5}^{(s)}}{8} \tag{4346a}$$

$$\frac{\sqrt{3}Y_{6,1}^{(c)}}{4} + \frac{\sqrt{30}Y_{6,3}^{(c)}}{8} - \frac{\sqrt{22}Y_{6,5}^{(c)}}{8} \tag{4346b}$$

$$-Y_{6,4}^{(s)} \tag{4346c}$$

32.7.3 $T_{1g} : l = 8$

$$\frac{3\sqrt{22}Y_{8,1}^{(s)}}{16} + \frac{\sqrt{210}Y_{8,3}^{(s)}}{48} + \frac{\sqrt{182}Y_{8,5}^{(s)}}{48} + \frac{\sqrt{130}Y_{8,7}^{(s)}}{48} \tag{4347a}$$

$$\frac{3\sqrt{22}Y_{8,1}^{(c)}}{16} - \frac{\sqrt{210}Y_{8,3}^{(c)}}{48} + \frac{\sqrt{182}Y_{8,5}^{(c)}}{48} - \frac{\sqrt{130}Y_{8,7}^{(c)}}{48} \tag{4347b}$$

$$\frac{\sqrt{14}Y_{8,4}^{(s)}}{12} + \frac{\sqrt{130}Y_{8,8}^{(s)}}{12} \tag{4347c}$$

$$\frac{\sqrt{78}Y_{8,3}^{(s)}}{12} - \frac{\sqrt{10}Y_{8,5}^{(s)}}{12} - \frac{\sqrt{14}Y_{8,7}^{(s)}}{6} \tag{4348a}$$

$$-\frac{\sqrt{78}Y_{8,3}^{(c)}}{12} - \frac{\sqrt{10}Y_{8,5}^{(c)}}{12} + \frac{\sqrt{14}Y_{8,7}^{(c)}}{6} \tag{4348b}$$

$$-\frac{\sqrt{130}Y_{8,4}^{(s)}}{12} + \frac{\sqrt{14}Y_{8,8}^{(s)}}{12} \tag{4348c}$$

32.7.4 $T_{1g} : l = 10$

$$-\frac{\sqrt{65}Y_{10,1}^{(s)}}{16} + \frac{7\sqrt{30}Y_{10,3}^{(s)}}{80} + \frac{3\sqrt{6}Y_{10,5}^{(s)}}{16} + \frac{3\sqrt{510}Y_{10,7}^{(s)}}{160} + \frac{\sqrt{3230}Y_{10,9}^{(s)}}{160} \tag{4349a}$$

$$-\frac{\sqrt{65}Y_{10,1}^{(c)}}{16} - \frac{7\sqrt{30}Y_{10,3}^{(c)}}{80} + \frac{3\sqrt{6}Y_{10,5}^{(c)}}{16} - \frac{3\sqrt{510}Y_{10,7}^{(c)}}{160} + \frac{\sqrt{3230}Y_{10,9}^{(c)}}{160} \tag{4349b}$$

$$\frac{\sqrt{15}Y_{10,4}^{(s)}}{10} + \frac{\sqrt{85}Y_{10,8}^{(s)}}{10} \tag{4349c}$$

$$\frac{\sqrt{170}Y_{10,3}^{(s)}}{40} - \frac{\sqrt{34}Y_{10,5}^{(s)}}{8} - \frac{\sqrt{10}Y_{10,7}^{(s)}}{40} + \frac{\sqrt{570}Y_{10,9}^{(s)}}{40} \tag{4350a}$$

$$-\frac{\sqrt{170}Y_{10,3}^{(c)}}{40} - \frac{\sqrt{34}Y_{10,5}^{(c)}}{8} + \frac{\sqrt{10}Y_{10,7}^{(c)}}{40} + \frac{\sqrt{570}Y_{10,9}^{(c)}}{40} \tag{4350b}$$

$$\frac{\sqrt{85}Y_{10,4}^{(s)}}{10} - \frac{\sqrt{15}Y_{10,8}^{(s)}}{10} \tag{4350c}$$

32.7.5 $T_{1g} : l = 12$

$$\frac{3\sqrt{976074}Y_{12,11}^{(s)}}{41152} + \frac{\sqrt{47976159}Y_{12,1}^{(s)}}{20576} - \frac{17\sqrt{207689}Y_{12,3}^{(s)}}{20576} - \frac{75\sqrt{24434}Y_{12,5}^{(s)}}{41152} + \frac{147\sqrt{27006}Y_{12,7}^{(s)}}{41152} + \frac{\sqrt{1286}Y_{12,9}^{(s)}}{64} \tag{4351a}$$

$$-\frac{3\sqrt{976074}Y_{12,11}^{(c)}}{41152} + \frac{\sqrt{47976159}Y_{12,1}^{(c)}}{20576} + \frac{17\sqrt{207689}Y_{12,3}^{(c)}}{20576} - \frac{75\sqrt{24434}Y_{12,5}^{(c)}}{41152} - \frac{147\sqrt{27006}Y_{12,7}^{(c)}}{41152} + \frac{\sqrt{1286}Y_{12,9}^{(c)}}{64} \tag{4351b}$$

$$\frac{\sqrt{162679}Y_{12,12}^{(s)}}{10288} - \frac{3\sqrt{207689}Y_{12,4}^{(s)}}{10288} + \frac{31\sqrt{27006}Y_{12,8}^{(s)}}{5144} \tag{4351c}$$

$$-\frac{215\sqrt{3663560658}Y_{12,11}^{(s)}}{22355824} - \frac{145\sqrt{498814323}Y_{12,1}^{(s)}}{5588956} + \frac{39\sqrt{261283693}Y_{12,3}^{(s)}}{11177912} - \frac{\sqrt{30739258}Y_{12,5}^{(s)}}{10288} + \frac{9\sqrt{12264963942}Y_{12,7}^{(s)}}{5588956} \tag{4352a}$$

$$\frac{215\sqrt{3663560658}Y_{12,11}^{(c)}}{22355824} - \frac{145\sqrt{498814323}Y_{12,1}^{(c)}}{5588956} - \frac{39\sqrt{261283693}Y_{12,3}^{(c)}}{11177912} - \frac{\sqrt{30739258}Y_{12,5}^{(c)}}{10288} - \frac{9\sqrt{12264963942}Y_{12,7}^{(c)}}{5588956} \tag{4352b}$$

$$-\frac{501\sqrt{610593443}Y_{12,12}^{(s)}}{22355824} - \frac{1145\sqrt{261283693}Y_{12,4}^{(s)}}{22355824} - \frac{9\sqrt{12264963942}Y_{12,8}^{(s)}}{11177912} \tag{4352c}$$

$$\frac{\sqrt{2844457}Y_{12,11}^{(s)}}{4346} - \frac{\sqrt{20891222}Y_{12,1}^{(s)}}{8692} - \frac{\sqrt{39883242}Y_{12,3}^{(s)}}{8692} - \frac{\sqrt{849643}Y_{12,7}^{(s)}}{4346} \tag{4353a}$$

$$-\frac{\sqrt{2844457}Y_{12,11}^{(c)}}{4346} - \frac{\sqrt{20891222}Y_{12,1}^{(c)}}{8692} + \frac{\sqrt{39883242}Y_{12,3}^{(c)}}{8692} + \frac{\sqrt{849643}Y_{12,7}^{(c)}}{4346} \tag{4353b}$$

$$-\frac{7\sqrt{17066742}Y_{12,12}^{(s)}}{34768} + \frac{3\sqrt{39883242}Y_{12,4}^{(s)}}{34768} + \frac{\sqrt{849643}Y_{12,8}^{(s)}}{8692} \tag{4353c}$$

32.8 T_{2g}

32.8.1 $T_{2g} : l = 2$

$$Y_{2,1}^{(s)} \tag{4354a}$$

$$-Y_{2,1}^{(c)} \tag{4354b}$$

$$-Y_{2,2}^{(s)} \tag{4354c}$$

32.8.2 $T_{2g} : l = 4$

$$-\frac{\sqrt{2}Y_{4,1}^{(s)}}{4} + \frac{\sqrt{14}Y_{4,3}^{(s)}}{4} \tag{4355a}$$

$$\frac{\sqrt{2}Y_{4,1}^{(c)}}{4} + \frac{\sqrt{14}Y_{4,3}^{(c)}}{4} \tag{4355b}$$

$$-Y_{4,2}^{(s)} \tag{4355c}$$

32.8.3 $T_{2g} : l = 6$

$$-\frac{3\sqrt{85}Y_{6,1}^{(s)}}{68} - \frac{\sqrt{34}Y_{6,3}^{(s)}}{8} + \frac{\sqrt{5610}Y_{6,5}^{(s)}}{136} \tag{4356a}$$

$$\frac{3\sqrt{85}Y_{6,1}^{(c)}}{68} - \frac{\sqrt{34}Y_{6,3}^{(c)}}{8} - \frac{\sqrt{5610}Y_{6,5}^{(c)}}{136} \tag{4356b}$$

$$-\frac{9\sqrt{34}Y_{6,2}^{(s)}}{68} + \frac{\sqrt{1870}Y_{6,6}^{(s)}}{68} \tag{4356c}$$

$$-\frac{\sqrt{187}Y_{6,1}^{(s)}}{17} - \frac{\sqrt{102}Y_{6,5}^{(s)}}{17} \tag{4357a}$$

$$\frac{\sqrt{187}Y_{6,1}^{(c)}}{17} + \frac{\sqrt{102}Y_{6,5}^{(c)}}{17} \tag{4357b}$$

$$\frac{\sqrt{1870}Y_{6,2}^{(s)}}{68} + \frac{9\sqrt{34}Y_{6,6}^{(s)}}{68} \tag{4357c}$$

32.8.4 $T_{2g} : l = 8$

$$-\frac{\sqrt{70}Y_{8,1}^{(s)}}{64} + \frac{3\sqrt{66}Y_{8,3}^{(s)}}{64} - \frac{\sqrt{1430}Y_{8,5}^{(s)}}{64} + \frac{\sqrt{2002}Y_{8,7}^{(s)}}{64} \tag{4358a}$$

$$\frac{\sqrt{70}Y_{8,1}^{(c)}}{64} + \frac{3\sqrt{66}Y_{8,3}^{(c)}}{64} + \frac{\sqrt{1430}Y_{8,5}^{(c)}}{64} + \frac{\sqrt{2002}Y_{8,7}^{(c)}}{64} \tag{4358b}$$

$$-Y_{8,2}^{(s)} \tag{4358c}$$

$$-\frac{\sqrt{858}Y_{8,1}^{(s)}}{64} + \frac{\sqrt{910}Y_{8,3}^{(s)}}{64} + \frac{7\sqrt{42}Y_{8,5}^{(s)}}{64} + \frac{3\sqrt{30}Y_{8,7}^{(s)}}{64} \tag{4359a}$$

$$\frac{\sqrt{858}Y_{8,1}^{(c)}}{64} + \frac{\sqrt{910}Y_{8,3}^{(c)}}{64} - \frac{7\sqrt{42}Y_{8,5}^{(c)}}{64} + \frac{3\sqrt{30}Y_{8,7}^{(c)}}{64} \tag{4359b}$$

$$-Y_{8,6}^{(s)} \tag{4359c}$$

32.8.5 $T_{2g} : l = 10$

$$-\frac{\sqrt{191}Y_{10,1}^{(s)}}{16} - \frac{7\sqrt{14898}Y_{10,3}^{(s)}}{3056} - \frac{3\sqrt{74490}Y_{10,5}^{(s)}}{3056} - \frac{3\sqrt{253266}Y_{10,7}^{(s)}}{6112} - \frac{\sqrt{1604018}Y_{10,9}^{(s)}}{6112} \tag{4360a}$$

$$\frac{\sqrt{191}Y_{10,1}^{(c)}}{16} - \frac{7\sqrt{14898}Y_{10,3}^{(c)}}{3056} + \frac{3\sqrt{74490}Y_{10,5}^{(c)}}{3056} - \frac{3\sqrt{253266}Y_{10,7}^{(c)}}{6112} + \frac{\sqrt{1604018}Y_{10,9}^{(c)}}{6112} \tag{4360b}$$

$$\frac{\sqrt{8020090}Y_{10,10}^{(s)}}{3056} + \frac{7\sqrt{573}Y_{10,2}^{(s)}}{1528} + \frac{9\sqrt{14898}Y_{10,6}^{(s)}}{3056} \tag{4360c}$$

$$-\frac{\sqrt{1367942}Y_{10,3}^{(s)}}{1528} + \frac{157\sqrt{6839710}Y_{10,5}^{(s)}}{5471768} + \frac{365\sqrt{23255014}Y_{10,7}^{(s)}}{5471768} + \frac{83\sqrt{1325535798}Y_{10,9}^{(s)}}{5471768} \tag{4361a}$$

$$-\frac{\sqrt{1367942}Y_{10,3}^{(c)}}{1528} - \frac{157\sqrt{6839710}Y_{10,5}^{(c)}}{5471768} + \frac{365\sqrt{23255014}Y_{10,7}^{(c)}}{5471768} - \frac{83\sqrt{1325535798}Y_{10,9}^{(c)}}{5471768} \tag{4361b}$$

$$\frac{25\sqrt{6627678990}Y_{10,10}^{(s)}}{5471768} - \frac{371\sqrt{8891623}Y_{10,2}^{(s)}}{2735884} - \frac{3909\sqrt{1367942}Y_{10,6}^{(s)}}{5471768} \tag{4361c}$$

$$-\frac{\sqrt{2313326}Y_{10,5}^{(s)}}{3581} + \frac{7\sqrt{680390}Y_{10,7}^{(s)}}{7162} - \frac{9\sqrt{107430}Y_{10,9}^{(s)}}{7162} \tag{4362a}$$

$$\frac{\sqrt{2313326}Y_{10,5}^{(c)}}{3581} + \frac{7\sqrt{680390}Y_{10,7}^{(c)}}{7162} + \frac{9\sqrt{107430}Y_{10,9}^{(c)}}{7162} \tag{4362b}$$

$$\frac{21\sqrt{21486}Y_{10,10}^{(s)}}{57296} + \frac{3\sqrt{75183095}Y_{10,2}^{(s)}}{28648} - \frac{7\sqrt{11566630}Y_{10,6}^{(s)}}{57296} \tag{4362c}$$

32.8.6 $T_{2g} : l = 12$

$$\frac{\sqrt{164255190}Y_{12,11}^{(s)}}{21440} - \frac{3\sqrt{77385}Y_{12,1}^{(s)}}{2144} + \frac{\sqrt{335}Y_{12,3}^{(s)}}{32} - \frac{27\sqrt{11390}Y_{12,5}^{(s)}}{21440} + \frac{\sqrt{4544610}Y_{12,7}^{(s)}}{21440} + \frac{17\sqrt{216410}Y_{12,9}^{(s)}}{21440} \tag{4363a}$$

$$\frac{\sqrt{164255190}Y_{12,11}^{(c)}}{21440} + \frac{3\sqrt{77385}Y_{12,1}^{(c)}}{2144} + \frac{\sqrt{335}Y_{12,3}^{(c)}}{32} + \frac{27\sqrt{11390}Y_{12,5}^{(c)}}{21440} + \frac{\sqrt{4544610}Y_{12,7}^{(c)}}{21440} - \frac{17\sqrt{216410}Y_{12,9}^{(c)}}{21440} \tag{4363b}$$

$$-\frac{\sqrt{3570765}Y_{12,10}^{(s)}}{5360} - \frac{9\sqrt{2010}Y_{12,2}^{(s)}}{1072} - \frac{23\sqrt{39865}Y_{12,6}^{(s)}}{5360} \tag{4363c}$$

$$-\frac{1123\sqrt{1157306410}Y_{12,11}^{(s)}}{201270680} - \frac{59\sqrt{56884125935}Y_{12,1}^{(s)}}{40254136} + \frac{853\sqrt{31549179090}Y_{12,5}^{(s)}}{201270680} + \frac{3359\sqrt{3874460590}Y_{12,7}^{(s)}}{402541360} + \frac{721\sqrt{1660483110}Y_{12,9}^{(s)}}{402541360} \tag{4364a}$$

$$-\frac{1123\sqrt{1157306410}Y_{12,11}^{(c)}}{201270680} + \frac{59\sqrt{56884125935}Y_{12,1}^{(c)}}{40254136} - \frac{853\sqrt{31549179090}Y_{12,5}^{(c)}}{201270680} + \frac{3359\sqrt{3874460590}Y_{12,7}^{(c)}}{402541360} - \frac{721\sqrt{1660483110}Y_{12,9}^{(c)}}{402541360} \tag{4364b}$$

$$-\frac{\sqrt{25158835}Y_{12,10}^{(s)}}{5360} + \frac{27\sqrt{178778681510}Y_{12,2}^{(s)}}{80508272} + \frac{391\sqrt{110422126815}Y_{12,6}^{(s)}}{402541360} \tag{4364c}$$

$$\frac{\sqrt{2527073549}Y_{12,11}^{(s)}}{150202} + \frac{3\sqrt{28087774}Y_{12,1}^{(s)}}{600808} - \frac{25\sqrt{1577121}Y_{12,5}^{(s)}}{150202} + \frac{275\sqrt{1426919}Y_{12,7}^{(s)}}{600808} - \frac{81\sqrt{29965299}Y_{12,9}^{(s)}}{600808} \tag{4365a}$$

$$\frac{\sqrt{2527073549}Y_{12,11}^{(c)}}{150202} - \frac{3\sqrt{28087774}Y_{12,1}^{(c)}}{600808} + \frac{25\sqrt{1577121}Y_{12,5}^{(c)}}{150202} + \frac{275\sqrt{1426919}Y_{12,7}^{(c)}}{600808} + \frac{81\sqrt{29965299}Y_{12,9}^{(c)}}{600808} \tag{4365b}$$

$$-\frac{23\sqrt{8937019}Y_{12,2}^{(s)}}{75101} + \frac{45\sqrt{450606}Y_{12,6}^{(s)}}{75101} \tag{4365c}$$

32.9 T_{1u}

32.9.1 $T_{1u} : l = 1$

$$Y_{1,1}^{(c)} \tag{4366a}$$

$$-Y_{1,1}^{(s)} \tag{4366b}$$

$$-Y_{1,0}^{(c)} \tag{4366c}$$

32.9.2 $T_{1u}: l = 3$

$$\frac{\sqrt{6}Y_{3,1}^{(c)}}{4} - \frac{\sqrt{10}Y_{3,3}^{(c)}}{4} \tag{4367a}$$

$$-\frac{\sqrt{6}Y_{3,1}^{(s)}}{4} - \frac{\sqrt{10}Y_{3,3}^{(s)}}{4} \tag{4367b}$$

$$Y_{3,0}^{(c)} \tag{4367c}$$

32.9.3 $T_{1u}: l = 5$

$$\frac{\sqrt{1785}Y_{5,1}^{(c)}}{68} - \frac{3\sqrt{170}Y_{5,3}^{(c)}}{136} + \frac{\sqrt{34}Y_{5,5}^{(c)}}{8} \tag{4368a}$$

$$-\frac{\sqrt{1785}Y_{5,1}^{(s)}}{68} - \frac{3\sqrt{170}Y_{5,3}^{(s)}}{136} - \frac{\sqrt{34}Y_{5,5}^{(s)}}{8} \tag{4368b}$$

$$-\frac{3\sqrt{119}Y_{5,0}^{(c)}}{34} - \frac{\sqrt{85}Y_{5,4}^{(c)}}{34} \tag{4368c}$$

$$-\frac{\sqrt{51}Y_{5,1}^{(c)}}{17} - \frac{\sqrt{238}Y_{5,3}^{(c)}}{17} \tag{4369a}$$

$$\frac{\sqrt{51}Y_{5,1}^{(s)}}{17} - \frac{\sqrt{238}Y_{5,3}^{(s)}}{17} \tag{4369b}$$

$$-\frac{\sqrt{85}Y_{5,0}^{(c)}}{34} + \frac{3\sqrt{119}Y_{5,4}^{(c)}}{34} \tag{4369c}$$

32.9.4 $T_{1u}: l = 7$

$$\frac{\sqrt{118}Y_{7,1}^{(c)}}{16} - \frac{9\sqrt{354}Y_{7,3}^{(c)}}{944} - \frac{5\sqrt{3894}Y_{7,5}^{(c)}}{944} - \frac{\sqrt{354354}Y_{7,7}^{(c)}}{944} \tag{4370a}$$

$$-\frac{\sqrt{118}Y_{7,1}^{(s)}}{16} - \frac{9\sqrt{354}Y_{7,3}^{(s)}}{944} + \frac{5\sqrt{3894}Y_{7,5}^{(s)}}{944} - \frac{\sqrt{354354}Y_{7,7}^{(s)}}{944} \tag{4370b}$$

$$\frac{5\sqrt{826}Y_{7,0}^{(c)}}{236} + \frac{3\sqrt{3894}Y_{7,4}^{(c)}}{236} \tag{4370c}$$

$$\frac{\sqrt{9086}Y_{7,3}^{(c)}}{236} - \frac{7\sqrt{826}Y_{7,5}^{(c)}}{236} + \frac{\sqrt{1534}Y_{7,7}^{(c)}}{118} \tag{4371a}$$

$$\frac{\sqrt{9086}Y_{7,3}^{(s)}}{236} + \frac{7\sqrt{826}Y_{7,5}^{(s)}}{236} + \frac{\sqrt{1534}Y_{7,7}^{(s)}}{118} \tag{4371b}$$

$$-\frac{3\sqrt{3894}Y_{7,0}^{(c)}}{236} + \frac{5\sqrt{826}Y_{7,4}^{(c)}}{236} \tag{4371c}$$

32.9.5 $T_{1u}: l = 9$

$$\frac{3\sqrt{15}Y_{9,1}^{(c)}}{16} + \frac{\sqrt{770}Y_{9,3}^{(c)}}{240} + \frac{\sqrt{858}Y_{9,5}^{(c)}}{144} + \frac{7\sqrt{4290}Y_{9,7}^{(c)}}{1440} + \frac{\sqrt{72930}Y_{9,9}^{(c)}}{480} \tag{4372a}$$

$$-\frac{3\sqrt{15}Y_{9,1}^{(s)}}{16} + \frac{\sqrt{770}Y_{9,3}^{(s)}}{240} - \frac{\sqrt{858}Y_{9,5}^{(s)}}{144} + \frac{7\sqrt{4290}Y_{9,7}^{(s)}}{1440} - \frac{\sqrt{72930}Y_{9,9}^{(s)}}{480} \tag{4372b}$$

$$-\frac{7\sqrt{3}Y_{9,0}^{(c)}}{24} - \frac{\sqrt{15015}Y_{9,4}^{(c)}}{180} - \frac{\sqrt{36465}Y_{9,8}^{(c)}}{360} \tag{4372c}$$

$$\frac{\sqrt{10270}Y_{9,3}^{(c)}}{120} + \frac{31\sqrt{3318}Y_{9,5}^{(c)}}{5688} + \frac{41\sqrt{16590}Y_{9,7}^{(c)}}{28440} - \frac{7\sqrt{282030}Y_{9,9}^{(c)}}{9480} \tag{4373a}$$

$$\frac{\sqrt{10270}Y_{9,3}^{(s)}}{120} - \frac{31\sqrt{3318}Y_{9,5}^{(s)}}{5688} + \frac{41\sqrt{16590}Y_{9,7}^{(s)}}{28440} + \frac{7\sqrt{282030}Y_{9,9}^{(s)}}{9480} \tag{4373b}$$

$$\frac{\sqrt{237237}Y_{9,0}^{(c)}}{948} + \frac{53\sqrt{1185}Y_{9,4}^{(c)}}{7110} - \frac{31\sqrt{141015}Y_{9,8}^{(c)}}{14220} \tag{4373c}$$

$$\frac{\sqrt{2686}Y_{9,5}^{(c)}}{79} - \frac{\sqrt{13430}Y_{9,7}^{(c)}}{158} + \frac{\sqrt{790}Y_{9,9}^{(c)}}{158} \tag{4374a}$$

$$-\frac{\sqrt{2686}Y_{9,5}^{(s)}}{79} - \frac{\sqrt{13430}Y_{9,7}^{(s)}}{158} - \frac{\sqrt{790}Y_{9,9}^{(s)}}{158} \tag{4374b}$$

$$-\frac{\sqrt{192049}Y_{9,0}^{(c)}}{632} + \frac{\sqrt{47005}Y_{9,4}^{(c)}}{316} - \frac{7\sqrt{395}Y_{9,8}^{(c)}}{632} \tag{4374c}$$

32.9.6 $T_{1u}: l = 11$

$$-\frac{\sqrt{88179}Y_{11,11}^{(c)}}{512} + \frac{21\sqrt{66}Y_{11,1}^{(c)}}{512} - \frac{\sqrt{30030}Y_{11,3}^{(c)}}{512} + \frac{15\sqrt{143}Y_{11,5}^{(c)}}{512} - \frac{\sqrt{36465}Y_{11,7}^{(c)}}{512} + \frac{\sqrt{46189}Y_{11,9}^{(c)}}{512} \tag{4375a}$$

$$-\frac{\sqrt{88179}Y_{11,11}^{(s)}}{512} - \frac{21\sqrt{66}Y_{11,1}^{(s)}}{512} - \frac{\sqrt{30030}Y_{11,3}^{(s)}}{512} - \frac{15\sqrt{143}Y_{11,5}^{(s)}}{512} - \frac{\sqrt{36465}Y_{11,7}^{(s)}}{512} - \frac{\sqrt{46189}Y_{11,9}^{(s)}}{512} \tag{4375b}$$

$$Y_{11,0}^{(c)} \tag{4375c}$$

$$\frac{1357\sqrt{2674749}Y_{11,11}^{(c)}}{5928448} - \frac{205\sqrt{291721326}Y_{11,1}^{(c)}}{5928448} + \frac{5\sqrt{785403570}Y_{11,3}^{(c)}}{5928448} - \frac{949\sqrt{3740017}Y_{11,5}^{(c)}}{5928448} - \frac{427\sqrt{3300015}Y_{11,7}^{(c)}}{5928448} + \frac{3\sqrt{11579}Y_{11,9}^{(c)}}{512} \tag{4376a}$$

$$\frac{1357\sqrt{2674749}Y_{11,11}^{(s)}}{5928448} + \frac{205\sqrt{291721326}Y_{11,1}^{(s)}}{5928448} + \frac{5\sqrt{785403570}Y_{11,3}^{(s)}}{5928448} + \frac{949\sqrt{3740017}Y_{11,5}^{(s)}}{5928448} - \frac{427\sqrt{3300015}Y_{11,7}^{(s)}}{5928448} - \frac{3\sqrt{11579}Y_{11,9}^{(s)}}{512} \tag{4376b}$$

$$-\frac{2\sqrt{26180119}Y_{11,4}^{(c)}}{11579} - \frac{13\sqrt{173685}Y_{11,8}^{(c)}}{11579} \tag{4376c}$$

$$\frac{\sqrt{205700935}Y_{11,11}^{(c)}}{92632} + \frac{\sqrt{10536890}Y_{11,1}^{(c)}}{23158} + \frac{279\sqrt{23158}Y_{11,3}^{(c)}}{92632} - \frac{25\sqrt{1215795}Y_{11,5}^{(c)}}{92632} - \frac{8\sqrt{1377901}Y_{11,7}^{(c)}}{11579} \tag{4377a}$$

$$\frac{\sqrt{205700935}Y_{11,11}^{(s)}}{92632} - \frac{\sqrt{10536890}Y_{11,1}^{(s)}}{23158} + \frac{279\sqrt{23158}Y_{11,3}^{(s)}}{92632} + \frac{25\sqrt{1215795}Y_{11,5}^{(s)}}{92632} - \frac{8\sqrt{1377901}Y_{11,7}^{(s)}}{11579} \tag{4377b}$$

$$-\frac{13\sqrt{173685}Y_{11,4}^{(c)}}{11579} + \frac{2\sqrt{26180119}Y_{11,8}^{(c)}}{11579} \tag{4377c}$$

32.10 T_{2u}

32.10.1 $T_{2u} : l = 3$

$$\frac{\sqrt{10}Y_{3,1}^{(c)}}{4} + \frac{\sqrt{6}Y_{3,3}^{(c)}}{4} \tag{4378a}$$

$$\frac{\sqrt{10}Y_{3,1}^{(s)}}{4} - \frac{\sqrt{6}Y_{3,3}^{(s)}}{4} \tag{4378b}$$

$$Y_{3,2}^{(c)} \tag{4378c}$$

32.10.2 $T_{2u} : l = 5$

$$\frac{\sqrt{7}Y_{5,1}^{(c)}}{4} - \frac{\sqrt{6}Y_{5,3}^{(c)}}{8} - \frac{\sqrt{30}Y_{5,5}^{(c)}}{8} \tag{4379a}$$

$$\frac{\sqrt{7}Y_{5,1}^{(s)}}{4} + \frac{\sqrt{6}Y_{5,3}^{(s)}}{8} - \frac{\sqrt{30}Y_{5,5}^{(s)}}{8} \tag{4379b}$$

$$-Y_{5,2}^{(c)} \tag{4379c}$$

32.10.3 $T_{2u} : l = 7$

$$\frac{\sqrt{858}Y_{7,1}^{(c)}}{64} + \frac{3\sqrt{286}Y_{7,3}^{(c)}}{64} + \frac{5\sqrt{26}Y_{7,5}^{(c)}}{64} + \frac{\sqrt{14}Y_{7,7}^{(c)}}{64} \tag{4380a}$$

$$\frac{\sqrt{858}Y_{7,1}^{(s)}}{64} - \frac{3\sqrt{286}Y_{7,3}^{(s)}}{64} + \frac{5\sqrt{26}Y_{7,5}^{(s)}}{64} - \frac{\sqrt{14}Y_{7,7}^{(s)}}{64} \tag{4380b}$$

$$Y_{7,6}^{(c)} \tag{4380c}$$

$$-\frac{15\sqrt{6}Y_{7,1}^{(c)}}{64} + \frac{19\sqrt{2}Y_{7,3}^{(c)}}{64} - \frac{\sqrt{22}Y_{7,5}^{(c)}}{64} - \frac{\sqrt{2002}Y_{7,7}^{(c)}}{64} \tag{4381a}$$

$$-\frac{15\sqrt{6}Y_{7,1}^{(s)}}{64} - \frac{19\sqrt{2}Y_{7,3}^{(s)}}{64} - \frac{\sqrt{22}Y_{7,5}^{(s)}}{64} + \frac{\sqrt{2002}Y_{7,7}^{(s)}}{64} \tag{4381b}$$

$$-Y_{7,2}^{(c)} \tag{4381c}$$

32.10.4 $T_{2u} : l = 9$

$$-\frac{7\sqrt{22}Y_{9,1}^{(c)}}{64} + \frac{3\sqrt{21}Y_{9,3}^{(c)}}{32} - \frac{\sqrt{65}Y_{9,5}^{(c)}}{32} - \frac{\sqrt{13}Y_{9,7}^{(c)}}{64} + \frac{3\sqrt{221}Y_{9,9}^{(c)}}{64} \tag{4382a}$$

$$-\frac{7\sqrt{22}Y_{9,1}^{(s)}}{64} - \frac{3\sqrt{21}Y_{9,3}^{(s)}}{32} - \frac{\sqrt{65}Y_{9,5}^{(s)}}{32} + \frac{\sqrt{13}Y_{9,7}^{(s)}}{64} + \frac{3\sqrt{221}Y_{9,9}^{(s)}}{64} \tag{4382b}$$

$$Y_{9,2}^{(c)} \tag{4382c}$$

$$-\frac{\sqrt{858}Y_{9,1}^{(c)}}{64} - \frac{\sqrt{91}Y_{9,3}^{(c)}}{32} + \frac{5\sqrt{15}Y_{9,5}^{(c)}}{32} + \frac{21\sqrt{3}Y_{9,7}^{(c)}}{64} + \frac{\sqrt{51}Y_{9,9}^{(c)}}{64} \tag{4383a}$$

$$-\frac{\sqrt{858}Y_{9,1}^{(s)}}{64} + \frac{\sqrt{91}Y_{9,3}^{(s)}}{32} + \frac{5\sqrt{15}Y_{9,5}^{(s)}}{32} - \frac{21\sqrt{3}Y_{9,7}^{(s)}}{64} + \frac{\sqrt{51}Y_{9,9}^{(s)}}{64} \tag{4383b}$$

$$Y_{9,6}^{(c)} \tag{4383c}$$

32.10.5 $T_{2u} : l = 11$

$$-\frac{\sqrt{44814}Y_{11,11}^{(c)}}{18624} - \frac{\sqrt{1221909}Y_{11,1}^{(c)}}{3104} - \frac{\sqrt{3289755}Y_{11,3}^{(c)}}{9312} + \frac{13\sqrt{62662}Y_{11,5}^{(c)}}{6208} - \frac{29\sqrt{55290}Y_{11,7}^{(c)}}{18624} - \frac{3\sqrt{194}Y_{11,9}^{(c)}}{64} \tag{4384a}$$

$$\frac{\sqrt{44814}Y_{11,11}^{(s)}}{18624} - \frac{\sqrt{1221909}Y_{11,1}^{(s)}}{3104} + \frac{\sqrt{3289755}Y_{11,3}^{(s)}}{9312} + \frac{13\sqrt{62662}Y_{11,5}^{(s)}}{6208} + \frac{29\sqrt{55290}Y_{11,7}^{(s)}}{18624} - \frac{3\sqrt{194}Y_{11,9}^{(s)}}{64} \tag{4384b}$$

$$-\frac{3\sqrt{2037}Y_{11,10}^{(c)}}{1552} + \frac{\sqrt{939930}Y_{11,2}^{(c)}}{4656} - \frac{61\sqrt{5529}Y_{11,6}^{(c)}}{4656} \tag{4384c}$$

$$-\frac{5\sqrt{4257330}Y_{11,11}^{(c)}}{51216} + \frac{\sqrt{321555}Y_{11,1}^{(c)}}{4268} + \frac{107\sqrt{34629}Y_{11,3}^{(c)}}{25608} + \frac{71\sqrt{16490}Y_{11,5}^{(c)}}{17072} + \frac{11\sqrt{582}Y_{11,7}^{(c)}}{1164} \tag{4385a}$$

$$\frac{5\sqrt{4257330}Y_{11,11}^{(s)}}{51216} + \frac{\sqrt{321555}Y_{11,1}^{(s)}}{4268} - \frac{107\sqrt{34629}Y_{11,3}^{(s)}}{25608} + \frac{71\sqrt{16490}Y_{11,5}^{(s)}}{17072} - \frac{11\sqrt{582}Y_{11,7}^{(s)}}{1164} \tag{4385b}$$

$$\frac{37\sqrt{193515}Y_{11,10}^{(c)}}{17072} - \frac{137\sqrt{9894}Y_{11,2}^{(c)}}{51216} - \frac{191\sqrt{1455}Y_{11,6}^{(c)}}{51216} \tag{4385c}$$

$$\frac{\sqrt{3553}Y_{11,11}^{(c)}}{88} + \frac{\sqrt{182}Y_{11,1}^{(c)}}{22} - \frac{5\sqrt{10}Y_{11,3}^{(c)}}{88} + \frac{7\sqrt{21}Y_{11,5}^{(c)}}{88} \tag{4386a}$$

$$-\frac{\sqrt{3553}Y_{11,11}^{(s)}}{88} + \frac{\sqrt{182}Y_{11,1}^{(s)}}{22} + \frac{5\sqrt{10}Y_{11,3}^{(s)}}{88} + \frac{7\sqrt{21}Y_{11,5}^{(s)}}{88} \tag{4386b}$$

$$\frac{\sqrt{646}Y_{11,10}^{(c)}}{88} + \frac{7\sqrt{35}Y_{11,2}^{(c)}}{44} + \frac{\sqrt{238}Y_{11,6}^{(c)}}{88} \tag{4386c}$$