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$$C_6(L_A M_A M_A; 000) = C_{6,0}(L_A) - \frac{3M_A^2 - L_A(L_A+1)}{(2L_A-1)(2L_A+3)}\, C_{6,2}(L_A)$$

$$= C_{6(0,0)0}\, (-1)^{L_A-M_A} \sum \langle L_A M_A L_A -M_A|00\rangle \langle 0000|00\rangle \langle 0000|00\rangle$$

$$+\, C_{6(2,0)2}\, (-1)^{L_A-M_A} \sum \langle L_A M_A L_A -M_A|20\rangle \langle 20|00|20\rangle \langle 2000|20\rangle$$

$$\langle L_A M_A L_A -M_A|00\rangle = \frac{(-1)^{L_A-M_A}}{\sqrt{2L_A+1}}$$

$$\boxed{C_{6(0,0)0}\, \frac{1}{\sqrt{2L_A+1}} = C_{6,0}(L_A)}$$

$$-\frac{3M_A^2 - L_A(L_A+1)}{(2L_A-1)(2L_A+3)}\, C_{6,2}(L_A) = C_{6(2,0)2}\, (-1)^{L_A-M_A} \langle L_A M_A L_A -M_A|20\rangle$$

$$\cancel{= \frac{\langle L_A M_A 20|L_A M_A\rangle}{2L_A}}$$

$$\langle L_A M_A L_A -M_A|20\rangle = \sqrt{5}\begin{pmatrix} L_A & L_A & 2 \\ M_A & -M_A & 0 \end{pmatrix}$$

$$= \sqrt{5}\begin{pmatrix} L_A & 2 & L_A \\ M_A & 0 & -M_A \end{pmatrix} = \sqrt{5}\, \frac{(-1)^{L_A+M_A}}{\sqrt{2L_A+1}} \langle L_A M_A 20|L_A M_A\rangle$$

$$= \sqrt{\frac{5}{2L_A+1}}\, (-1)^{L_A+M_A}\, \frac{3M_A^2 - L_A(L_A+1)}{\sqrt{L_A(L_A+1)(2L_A-1)(2L_A+3)}}$$

$$-\frac{\cancel{3M^2-L(L+1)}}{(2L-1)(2L+3)}C_{6,2}=C_{6(2,0)2}(-1)^{2L_B}\sqrt{\frac{5}{2L_B+1}}\frac{\cancel{3M^2-L(L+1)}}{\sqrt{L(L+1)(2L-1)(2L+3)}}$$

$$C_{6,2}=-\sqrt{\frac{5(2L-1)(2L+3)}{L(L+1)(2L+1)}}\;C_{6(2,0),2}$$

$$C_{6(0,0)0}=\frac{1}{\pi}\int_0^\infty \alpha^A_{(1,1)0}(i\omega)\,\alpha^B_{(1,1)0}(i\omega)\,d\omega$$

$$C_{6,0}=\frac{3}{\pi}\int_0^\infty \alpha_0(L)\,\bar{\alpha}_0\,d\omega$$

$$\alpha_0=-\frac{\alpha^+_{(1,1)0}}{\sqrt{3(2L+1)}}$$

$$C_{6,0}=\frac{1}{\pi\sqrt{2L+1}}\int_0^\infty \alpha^+_{(1,1)0}(L)\,\alpha^+_{(1,1)0}(0)\,d\omega$$

$$=\frac{1}{\sqrt{2L+1}}\;\frac{1}{\pi}\int_0^\infty \alpha^+_{(1,1)0}(L)\;\alpha^+_{(1,1)0}(0)\;d\omega$$

$$\boxed{C_{6,0}=\frac{1}{\sqrt{2L+1}}\;C_{6(0,0)0}}$$

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$$C_{6,2} = -\frac{3(2L+3)}{2\pi L}\int_0^\infty \alpha_2(L)\,\bar{\alpha}_0(0)\,d\omega$$

$$= +\frac{3(2L+3)}{2\pi L}\;\frac{+\,\cancel{\ldots}}{\sqrt{3\cancel{(2L+1)}}}\;\sqrt{\frac{10L(2L-1)}{3(L+1)(2L+1)(2L+3)}}$$

$L_B = 0$

$$\int_0^\infty \alpha^+_{(1,1)2}(L)\,\alpha^+_{(1,1)0}\,d\omega$$

$$C_{6(202)2} = \frac{f^{(202)}_{1,1,1,1}}{2\pi}\int \alpha^A_{(11)2}(L)\,\alpha^B_{(11)0}(0)\,d\omega$$

$$= \frac{-\sqrt{2}}{2\pi}\int \alpha^+_{(11)2}(L)\,\alpha^+_{(1,1)0}(0)\,d\omega$$

$$= \frac{-1}{\pi\sqrt{2}}\int_0^\infty \alpha^+_{(11)2}(L)\,\alpha^+_{(1,1)0}(0)\,d\omega$$

$$C_{6,2} = -\frac{\cancel{3}\,\cancel{(2L+3)}}{\sqrt{2}\,\cancel{L}}\;\frac{1}{\sqrt{\cancel{3}\,\cancel{(2L+1)}}}\;\sqrt{\frac{\cancel{10}^{\,5}\,\cancel{L}(2L-1)\;(2L+3)}{\cancel{2}\,\cancel{3}(L+1)(2L+1)\cancel{(2L+3)}}}$$

$$\frac{-1}{\pi\sqrt{2}}\int_0^\infty \alpha^+_{(11)2}(L)\,\alpha^+_{(1,1)0}\,d\omega$$

$$= -\cancel{q}\;\cancel{\frac{1}{\sqrt{2L+1}}}\;\sqrt{\frac{5(2L-1)(2L+3)}{L(L+1)(2L+1)}}\qquad C_{6(2,0)2}$$