

PG No. 5 C_{2h} $2/m$ (b-axis setting) [monoclinic] (polar, internal axial quadrupole)

* Harmonics for rank 0

* Harmonics for rank 1

$$\tilde{Q}_1^{(2,1)}[g](A_u)$$

** symmetry

$$y$$

** expression

$$\frac{3\sqrt{10}G_u xz}{10} - \frac{\sqrt{30}G_v xz}{10} - \frac{\sqrt{30}G_{xy} yz}{10} + \frac{\sqrt{30}G_{xz} (x-z)(x+z)}{10} + \frac{\sqrt{30}G_{yz} xy}{10}$$

$$\tilde{Q}_1^{(2,1)}[g](B_u, 1)$$

** symmetry

$$x$$

** expression

$$-\frac{3\sqrt{10}G_u yz}{10} - \frac{\sqrt{30}G_v yz}{10} + \frac{\sqrt{30}G_{xy} xz}{10} - \frac{\sqrt{30}G_{xz} xy}{10} - \frac{\sqrt{30}G_{yz} (y-z)(y+z)}{10}$$

$$\tilde{Q}_1^{(2,1)}[g](B_u, 2)$$

** symmetry

$$z$$

** expression

$$\frac{\sqrt{30}G_v xy}{5} - \frac{\sqrt{30}G_{xy} (x-y)(x+y)}{10} + \frac{\sqrt{30}G_{xz} yz}{10} - \frac{\sqrt{30}G_{yz} xz}{10}$$

* Harmonics for rank 2

$$\tilde{Q}_2^{(2,-1)}[g](A_g, 1)$$

** symmetry

$$-\frac{x^2}{2} - \frac{y^2}{2} + z^2$$

** expression

$$\frac{\sqrt{2}G_{xz} y}{2} - \frac{\sqrt{2}G_{yz} x}{2}$$

$$\tilde{Q}_2^{(2,-1)}[g](A_g, 2)$$

** symmetry

$$\frac{\sqrt{3}(x-y)(x+y)}{2}$$

** expression

$$\frac{\sqrt{6}G_{xyz}}{3} - \frac{\sqrt{6}G_{xz} y}{6} - \frac{\sqrt{6}G_{yz} x}{6}$$

$$\tilde{Q}_2^{(2,-1)}[g](A_g, 3)$$

** symmetry

$$\sqrt{3}xz$$

** expression

$$-\frac{\sqrt{2}G_u y}{2} + \frac{\sqrt{6}G_v y}{6} - \frac{\sqrt{6}G_{xy} x}{6} + \frac{\sqrt{6}G_{yz} z}{6}$$

$$\tilde{Q}_2^{(2,1)}[g](A_g, 1)$$

** symmetry

$$-\frac{x^2}{2} - \frac{y^2}{2} + z^2$$

** expression

$$\frac{5\sqrt{42}G_v xyz}{14} - \frac{5\sqrt{42}G_{xy} z (x-y)(x+y)}{28} - \frac{\sqrt{42}G_{xz} y (x^2 + y^2 - 4z^2)}{28} + \frac{\sqrt{42}G_{yz} x (x^2 + y^2 - 4z^2)}{28}$$

$$\tilde{Q}_2^{(2,1)}[g](A_g, 2)$$

** symmetry

$$\frac{\sqrt{3}(x-y)(x+y)}{2}$$

** expression

$$-\frac{5\sqrt{42}G_uxyz}{14} + \frac{\sqrt{14}G_{xy}z(3x^2+3y^2-2z^2)}{28} - \frac{\sqrt{14}G_{xz}y(9x^2-y^2-6z^2)}{28} + \frac{\sqrt{14}G_{yz}x(x^2-9y^2+6z^2)}{28}$$

$$\tilde{\mathbb{Q}}_2^{(2,1)}[g](A_g, 3)$$

** symmetry

$$\sqrt{3}xz$$

** expression

$$\frac{\sqrt{42}G_u y(x^2+y^2-4z^2)}{28} + \frac{\sqrt{14}G_v y(9x^2-y^2-6z^2)}{28} - \frac{\sqrt{14}G_{xy}x(2x^2-3y^2-3z^2)}{14} - \frac{\sqrt{14}G_{yz}z(3x^2+3y^2-2z^2)}{14}$$

$$\tilde{\mathbb{Q}}_2^{(2,-1)}[g](B_g, 1)$$

** symmetry

$$\sqrt{3}yz$$

** expression

$$\frac{\sqrt{2}G_u x}{2} + \frac{\sqrt{6}G_v x}{6} + \frac{\sqrt{6}G_{xy}y}{6} - \frac{\sqrt{6}G_{xz}z}{6}$$

$$\tilde{\mathbb{Q}}_2^{(2,-1)}[g](B_g, 2)$$

** symmetry

$$\sqrt{3}xy$$

** expression

$$-\frac{\sqrt{6}G_v z}{3} + \frac{\sqrt{6}G_{xz}x}{6} - \frac{\sqrt{6}G_{yz}y}{6}$$

$$\tilde{\mathbb{Q}}_2^{(2,1)}[g](B_g, 1)$$

** symmetry

$$\sqrt{3}yz$$

** expression

$$-\frac{\sqrt{42}G_u x(x^2+y^2-4z^2)}{28} - \frac{\sqrt{14}G_v x(x^2-9y^2+6z^2)}{28} - \frac{\sqrt{14}G_{xy}y(3x^2-2y^2+3z^2)}{14} + \frac{\sqrt{14}G_{xz}z(3x^2+3y^2-2z^2)}{14}$$

$$\tilde{\mathbb{Q}}_2^{(2,1)}[g](B_g, 2)$$

** symmetry

$$\sqrt{3}xy$$

** expression

$$\frac{5\sqrt{42}G_u z(x-y)(x+y)}{28} - \frac{\sqrt{14}G_v z(3x^2+3y^2-2z^2)}{28} + \frac{\sqrt{14}G_{xz}x(2x^2-3y^2-3z^2)}{14} + \frac{\sqrt{14}G_{yz}y(3x^2-2y^2+3z^2)}{14}$$

* Harmonics for rank 3

$$\tilde{\mathbb{Q}}_3^{(2,-1)}[g](A_u, 1)$$

** symmetry

$$\sqrt{15}xyz$$

** expression

$$\frac{\sqrt{6}G_u(x-y)(x+y)}{4} + \frac{\sqrt{2}G_v(x^2+y^2-2z^2)}{4}$$

$$\tilde{\mathbb{Q}}_3^{(2,-1)}[g](A_u, 2)$$

** symmetry

$$-\frac{y(3x^2-2y^2+3z^2)}{2}$$

** expression

$$-\frac{3\sqrt{10}G_u xz}{20} + \frac{\sqrt{30}G_v xz}{20} - \frac{\sqrt{30}G_{xy}yz}{5} - \frac{\sqrt{30}G_{xz}(x-z)(x+z)}{20} + \frac{\sqrt{30}G_{yz}xy}{5}$$

$$\tilde{\mathbb{Q}}_3^{(2,-1)}[g](A_u, 3)$$

** symmetry

$$-\frac{\sqrt{15}y(x-z)(x+z)}{2}$$

** expression

$$\frac{\sqrt{6}G_u xz}{4} + \frac{3\sqrt{2}G_v xz}{4} - \frac{\sqrt{2}G_{xz}(x^2 - 2y^2 + z^2)}{4}$$

$$\tilde{\mathbb{Q}}_3^{(2,1)}[g](A_u, 1)$$

** symmetry

$$\sqrt{15}xyz$$

** expression

$$-\frac{\sqrt{3}G_u(x-y)(x+y)(x^2+y^2-6z^2)}{6} - \frac{G_v(x^4-12x^2y^2+6x^2z^2+y^4+6y^2z^2-2z^4)}{6} \\ - \frac{7G_{xy}xy(x-y)(x+y)}{6} + \frac{7G_{xz}xz(x-z)(x+z)}{6} - \frac{7G_{yz}yz(y-z)(y+z)}{6}$$

$$\tilde{\mathbb{Q}}_3^{(2,1)}[g](A_u, 2)$$

** symmetry

$$-\frac{y(3x^2-2y^2+3z^2)}{2}$$

** expression

$$-\frac{\sqrt{5}G_u xz(x^2-6y^2+z^2)}{4} + \frac{\sqrt{15}G_v xz(x^2-6y^2+z^2)}{12} + \frac{\sqrt{15}G_{xy}yz(3x^2-4y^2+3z^2)}{12} \\ - \frac{\sqrt{15}G_{xz}(x-z)(x+z)(x^2-6y^2+z^2)}{12} - \frac{\sqrt{15}G_{yz}xy(3x^2-4y^2+3z^2)}{12}$$

$$\tilde{\mathbb{Q}}_3^{(2,1)}[g](A_u, 3)$$

** symmetry

$$-\frac{\sqrt{15}y(x-z)(x+z)}{2}$$

** expression

$$-\frac{\sqrt{3}G_u xz(9x^2-12y^2-5z^2)}{12} + \frac{G_v xz(x^2+36y^2-13z^2)}{12} - \frac{7G_{xy}yz(3x^2-2y^2+z^2)}{12} \\ - \frac{G_{xz}(5x^4-12x^2y^2-18x^2z^2+4y^4-12y^2z^2+5z^4)}{12} - \frac{7G_{yz}xy(x^2-2y^2+3z^2)}{12}$$

$$\tilde{\mathbb{Q}}_3^{(2,-1)}[g](B_u, 1)$$

** symmetry

$$\frac{x(2x^2-3y^2-3z^2)}{2}$$

** expression

$$\frac{3\sqrt{10}G_u yz}{20} + \frac{\sqrt{30}G_v yz}{20} + \frac{\sqrt{30}G_{xy}xz}{5} - \frac{\sqrt{30}G_{xz}xy}{5} + \frac{\sqrt{30}G_{yz}(y-z)(y+z)}{20}$$

$$\tilde{\mathbb{Q}}_3^{(2,-1)}[g](B_u, 2)$$

** symmetry

$$-\frac{z(3x^2+3y^2-2z^2)}{2}$$

** expression

$$-\frac{\sqrt{30}G_v xy}{10} + \frac{\sqrt{30}G_{xy}(x-y)(x+y)}{20} + \frac{\sqrt{30}G_{xz}yz}{5} - \frac{\sqrt{30}G_{yz}xz}{5}$$

$$\tilde{\mathbb{Q}}_3^{(2,-1)}[g](B_u, 3)$$

** symmetry

$$\frac{\sqrt{15}x(y-z)(y+z)}{2}$$

** expression

$$\frac{\sqrt{6}G_u yz}{4} - \frac{3\sqrt{2}G_v yz}{4} + \frac{\sqrt{2}G_{yz}(2x^2-y^2-z^2)}{4}$$

$$\tilde{\mathbb{Q}}_3^{(2,-1)}[g](B_u, 4)$$

** symmetry

$$\frac{\sqrt{15}z(x-y)(x+y)}{2}$$

** expression

$$-\frac{\sqrt{6}G_u xy}{2} - \frac{\sqrt{2}G_{xy}(x^2+y^2-2z^2)}{4}$$

$$\tilde{\mathbb{Q}}_3^{(2,1)}[g](B_u, 1)$$

** symmetry

$$\frac{x(2x^2-3y^2-3z^2)}{2}$$

** expression

$$-\frac{\sqrt{5}G_u yz(6x^2-y^2-z^2)}{4} - \frac{\sqrt{15}G_v yz(6x^2-y^2-z^2)}{12} + \frac{\sqrt{15}G_{xy}xz(4x^2-3y^2-3z^2)}{12} \\ - \frac{\sqrt{15}G_{xz}xy(4x^2-3y^2-3z^2)}{12} - \frac{\sqrt{15}G_{yz}(y-z)(y+z)(6x^2-y^2-z^2)}{12}$$

$$\tilde{\mathbb{Q}}_3^{(2,1)}[g](B_u, 2)$$

** symmetry

$$-\frac{z(3x^2+3y^2-2z^2)}{2}$$

** expression

$$-\frac{\sqrt{15}G_v xy(x^2+y^2-6z^2)}{6} + \frac{\sqrt{15}G_{xy}(x-y)(x+y)(x^2+y^2-6z^2)}{12} - \frac{\sqrt{15}G_{xz}yz(3x^2+3y^2-4z^2)}{12} + \frac{\sqrt{15}G_{yz}xz(3x^2+3y^2-4z^2)}{12}$$

$$\tilde{\mathbb{Q}}_3^{(2,1)}[g](B_u, 3)$$

** symmetry

$$\frac{\sqrt{15}x(y-z)(y+z)}{2}$$

** expression

$$\frac{\sqrt{3}G_u yz(12x^2-9y^2+5z^2)}{12} - \frac{G_v yz(36x^2+y^2-13z^2)}{12} + \frac{7G_{xy}xz(2x^2-3y^2-z^2)}{12} \\ + \frac{7G_{xz}xy(2x^2-y^2-3z^2)}{12} - \frac{G_{yz}(4x^4-12x^2y^2-12x^2z^2+5y^4-18y^2z^2+5z^4)}{12}$$

$$\tilde{\mathbb{Q}}_3^{(2,1)}[g](B_u, 4)$$

** symmetry

$$\frac{\sqrt{15}z(x-y)(x+y)}{2}$$

** expression

$$\frac{\sqrt{3}G_u xy(x^2+y^2-6z^2)}{3} + \frac{7G_v xy(x-y)(x+y)}{6} - \frac{G_{xy}(5x^4-18x^2y^2-12x^2z^2+5y^4-12y^2z^2+4z^4)}{12} \\ - \frac{7G_{xz}yz(3x^2+y^2-2z^2)}{12} - \frac{7G_{yz}xz(x^2+3y^2-2z^2)}{12}$$

* Harmonics for rank 4

$$\tilde{\mathbb{Q}}_4^{(2,-1)}[g](A_g, 1)$$

** symmetry

$$\frac{\sqrt{21}(x^4-3x^2y^2-3x^2z^2+y^4-3y^2z^2+z^4)}{6}$$

** expression

$$\frac{\sqrt{5}G_{xy}z(x-y)(x+y)}{2} - \frac{\sqrt{5}G_{xz}y(x-z)(x+z)}{2} + \frac{\sqrt{5}G_{yz}x(y-z)(y+z)}{2}$$

$$\tilde{\mathbb{Q}}_4^{(2,-1)}[g](A_g, 2)$$

** symmetry

$$-\frac{\sqrt{15}(x^4-12x^2y^2+6x^2z^2+y^4+6y^2z^2-2z^4)}{12}$$

** expression

$$-\frac{6\sqrt{7}G_v xyz}{7} - \frac{\sqrt{7}G_{xy}z(x-y)(x+y)}{14} + \frac{\sqrt{7}G_{xz}y(4x^2-3y^2+5z^2)}{14} + \frac{\sqrt{7}G_{yz}x(3x^2-4y^2-5z^2)}{14}$$

$$\bar{\mathbb{Q}}_4^{(2,-1)}[g](A_g, 3)$$

** symmetry

$$\frac{\sqrt{5}(x-y)(x+y)(x^2+y^2-6z^2)}{4}$$

** expression

$$\frac{6\sqrt{7}G_uxyz}{7} + \frac{\sqrt{21}G_{xy}z(3x^2+3y^2-2z^2)}{14} - \frac{\sqrt{21}G_{xz}y(2x^2-y^2+z^2)}{14} + \frac{\sqrt{21}G_{yz}x(x^2-2y^2-z^2)}{14}$$

$$\bar{\mathbb{Q}}_4^{(2,-1)}[g](A_g, 4)$$

** symmetry

$$-\frac{\sqrt{35}xz(x-z)(x+z)}{2}$$

** expression

$$\frac{3G_u y(x-z)(x+z)}{4} - \frac{\sqrt{3}G_v y(x-z)(x+z)}{4} + \frac{\sqrt{3}G_{xy}x(x^2-3z^2)}{4} + \sqrt{3}G_{xz}xyz - \frac{\sqrt{3}G_{yz}z(3x^2-z^2)}{4}$$

$$\bar{\mathbb{Q}}_4^{(2,-1)}[g](A_g, 5)$$

** symmetry

$$-\frac{\sqrt{5}xz(x^2-6y^2+z^2)}{2}$$

** expression

$$\frac{3\sqrt{7}G_u y(5x^2-2y^2+z^2)}{28} + \frac{\sqrt{21}G_v y(3x^2+2y^2-9z^2)}{28} + \frac{\sqrt{21}G_{xy}x(x^2+2y^2-5z^2)}{28} + \frac{\sqrt{21}G_{yz}z(5x^2-2y^2-z^2)}{28}$$

$$\bar{\mathbb{Q}}_4^{(2,1)}[g](A_g, 1)$$

** symmetry

$$\frac{\sqrt{21}(x^4-3x^2y^2-3x^2z^2+y^4-3y^2z^2+z^4)}{6}$$

** expression

$$-\frac{3\sqrt{2310}G_uxyz(x-y)(x+y)}{44} - \frac{3\sqrt{770}G_vxyz(x^2+y^2-2z^2)}{44} + \frac{\sqrt{770}G_{xy}z(x-y)(x+y)(x^2+y^2-2z^2)}{22} \\ - \frac{\sqrt{770}G_{xz}y(x-z)(x+z)(x^2-2y^2+z^2)}{22} - \frac{\sqrt{770}G_{yz}x(y-z)(y+z)(2x^2-y^2-z^2)}{22}$$

$$\bar{\mathbb{Q}}_4^{(2,1)}[g](A_g, 2)$$

** symmetry

$$-\frac{\sqrt{15}(x^4-12x^2y^2+6x^2z^2+y^4+6y^2z^2-2z^4)}{12}$$

** expression

$$\frac{21\sqrt{66}G_uxyz(x-y)(x+y)}{44} - \frac{21\sqrt{22}G_vxyz(x^2+y^2-2z^2)}{44} + \frac{7\sqrt{22}G_{xy}z(x-y)(x+y)(x^2+y^2-2z^2)}{44} \\ + \frac{\sqrt{22}G_{xz}y(17x^4-22x^2y^2-36x^2z^2+3y^4-8y^2z^2+10z^4)}{44} - \frac{\sqrt{22}G_{yz}x(3x^4-22x^2y^2-8x^2z^2+17y^4-36y^2z^2+10z^4)}{44}$$

$$\bar{\mathbb{Q}}_4^{(2,1)}[g](A_g, 3)$$

** symmetry

$$\frac{\sqrt{5}(x-y)(x+y)(x^2+y^2-6z^2)}{4}$$

** expression

$$-\frac{21\sqrt{22}G_uxyz(x^2+y^2-2z^2)}{44} - \frac{21\sqrt{66}G_vxyz(x-y)(x+y)}{44} + \frac{\sqrt{66}G_{xy}z(9x^4-24x^2y^2-10x^2z^2+9y^4-10y^2z^2+2z^4)}{44} \\ - \frac{\sqrt{66}G_{xz}y(x^4+2x^2y^2-12x^2z^2+y^4-12y^2z^2+8z^4)}{44} - \frac{\sqrt{66}G_{yz}x(x^4+2x^2y^2-12x^2z^2+y^4-12y^2z^2+8z^4)}{44}$$

$$\bar{\mathbb{Q}}_4^{(2,1)}[g](A_g, 4)$$

** symmetry

$$-\frac{\sqrt{35}xz(x-z)(x+z)}{2}$$

** expression

$$-\frac{3\sqrt{154}G_u y (x^4 + x^2 y^2 - 9x^2 z^2 - y^2 z^2 + 2z^4)}{88} - \frac{\sqrt{462}G_v y (5x^4 - x^2 y^2 - 27x^2 z^2 + y^2 z^2 + 4z^4)}{88} \\ + \frac{\sqrt{462}G_{xy} x (x^4 - 2x^2 y^2 - 8x^2 z^2 + 6y^2 z^2 + 3z^4)}{44} + \frac{\sqrt{462}G_{xz} x y z (x^2 - 2y^2 + z^2)}{44} + \frac{\sqrt{462}G_{yz} z (3x^4 + 6x^2 y^2 - 8x^2 z^2 - 2y^2 z^2 + z^4)}{44}$$

$$\bar{Q}_4^{(2,1)}[g](A_g, 5)$$

** symmetry

$$-\frac{\sqrt{5}xz (x^2 - 6y^2 + z^2)}{2}$$

** expression

$$-\frac{3\sqrt{22}G_u y (5x^4 + 3x^2 y^2 - 39x^2 z^2 - 2y^4 + 17y^2 z^2 - 2z^4)}{88} - \frac{\sqrt{66}G_v y (9x^4 - 31x^2 y^2 + 39x^2 z^2 + 2y^4 + 11y^2 z^2 - 12z^4)}{88} \\ + \frac{\sqrt{66}G_{xy} x (x^4 - 12x^2 y^2 + 2x^2 z^2 + 8y^4 - 12y^2 z^2 + z^4)}{44} + \frac{21\sqrt{66}G_{xz} x y z (x - z) (x + z)}{44} - \frac{\sqrt{66}G_{yz} z (x^4 - 12x^2 y^2 + 2x^2 z^2 + 8y^4 - 12y^2 z^2 + z^4)}{44}$$

$$\bar{Q}_4^{(2,-1)}[g](B_g, 1)$$

** symmetry

$$\frac{\sqrt{35}yz (y - z) (y + z)}{2}$$

** expression

$$\frac{3G_u x (y - z) (y + z)}{4} + \frac{\sqrt{3}G_v x (y - z) (y + z)}{4} + \frac{\sqrt{3}G_{xy} y (y^2 - 3z^2)}{4} - \frac{\sqrt{3}G_{xz} z (3y^2 - z^2)}{4} + \sqrt{3}G_{yz} x y z$$

$$\bar{Q}_4^{(2,-1)}[g](B_g, 2)$$

** symmetry

$$\frac{\sqrt{35}xy (x - y) (x + y)}{2}$$

** expression

$$-\frac{\sqrt{3}G_v z (x - y) (x + y)}{2} + \sqrt{3}G_{xy} x y z + \frac{\sqrt{3}G_{xz} x (x^2 - 3y^2)}{4} - \frac{\sqrt{3}G_{yz} y (3x^2 - y^2)}{4}$$

$$\bar{Q}_4^{(2,-1)}[g](B_g, 3)$$

** symmetry

$$\frac{\sqrt{5}yz (6x^2 - y^2 - z^2)}{2}$$

** expression

$$\frac{3\sqrt{7}G_u x (2x^2 - 5y^2 - z^2)}{28} + \frac{\sqrt{21}G_v x (2x^2 + 3y^2 - 9z^2)}{28} - \frac{\sqrt{21}G_{xy} y (2x^2 + y^2 - 5z^2)}{28} + \frac{\sqrt{21}G_{xz} z (2x^2 - 5y^2 + z^2)}{28}$$

$$\bar{Q}_4^{(2,-1)}[g](B_g, 4)$$

** symmetry

$$-\frac{\sqrt{5}xy (x^2 + y^2 - 6z^2)}{2}$$

** expression

$$\frac{3\sqrt{7}G_u z (x - y) (x + y)}{7} + \frac{\sqrt{21}G_v z (3x^2 + 3y^2 - 2z^2)}{14} - \frac{\sqrt{21}G_{xz} x (x^2 - 5y^2 + 2z^2)}{28} - \frac{\sqrt{21}G_{yz} y (5x^2 - y^2 - 2z^2)}{28}$$

$$\bar{Q}_4^{(2,1)}[g](B_g, 1)$$

** symmetry

$$\frac{\sqrt{35}yz (y - z) (y + z)}{2}$$

** expression

$$-\frac{3\sqrt{154}G_u x (x^2 y^2 - x^2 z^2 + y^4 - 9y^2 z^2 + 2z^4)}{88} - \frac{\sqrt{462}G_v x (x^2 y^2 - x^2 z^2 - 5y^4 + 27y^2 z^2 - 4z^4)}{88} \\ - \frac{\sqrt{462}G_{xy} y (2x^2 y^2 - 6x^2 z^2 - y^4 + 8y^2 z^2 - 3z^4)}{44} + \frac{\sqrt{462}G_{xz} z (6x^2 y^2 - 2x^2 z^2 + 3y^4 - 8y^2 z^2 + z^4)}{44} - \frac{\sqrt{462}G_{yz} x y z (2x^2 - y^2 - z^2)}{44}$$

$$\bar{Q}_4^{(2,1)}[g](B_g, 2)$$

** symmetry

$$\frac{\sqrt{35}xy (x - y) (x + y)}{2}$$

** expression

$$\begin{aligned} & \frac{9\sqrt{154}G_u z (x^2 - 2xy - y^2) (x^2 + 2xy - y^2)}{88} - \frac{\sqrt{462}G_v z (x - y) (x + y) (x^2 + y^2 - 2z^2)}{44} + \frac{\sqrt{462}G_{xy}xyz (x^2 + y^2 - 2z^2)}{44} \\ & + \frac{\sqrt{462}G_{xz}x (x^4 - 8x^2y^2 - 2x^2z^2 + 3y^4 + 6y^2z^2)}{44} + \frac{\sqrt{462}G_{yz}y (3x^4 - 8x^2y^2 + 6x^2z^2 + y^4 - 2y^2z^2)}{44} \end{aligned}$$

$\tilde{\mathbb{Q}}_4^{(2,1)}[g](B_g, 3)$

** symmetry

$$\frac{\sqrt{5}yz (6x^2 - y^2 - z^2)}{2}$$

** expression

$$\begin{aligned} & - \frac{3\sqrt{22}G_u x (2x^4 - 3x^2y^2 - 17x^2z^2 - 5y^4 + 39y^2z^2 + 2z^4)}{88} - \frac{\sqrt{66}G_v x (2x^4 - 31x^2y^2 + 11x^2z^2 + 9y^4 + 39y^2z^2 - 12z^4)}{88} \\ & - \frac{\sqrt{66}G_{xy}y (8x^4 - 12x^2y^2 - 12x^2z^2 + y^4 + 2y^2z^2 + z^4)}{44} + \frac{\sqrt{66}G_{xz}z (8x^4 - 12x^2y^2 - 12x^2z^2 + y^4 + 2y^2z^2 + z^4)}{44} - \frac{21\sqrt{66}G_{yz}xyz (y - z) (y + z)}{44} \end{aligned}$$

$\tilde{\mathbb{Q}}_4^{(2,1)}[g](B_g, 4)$

** symmetry

$$- \frac{\sqrt{5}xy (x^2 + y^2 - 6z^2)}{2}$$

** expression

$$\begin{aligned} & - \frac{21\sqrt{22}G_u z (x - y) (x + y) (x^2 + y^2 - 2z^2)}{88} - \frac{\sqrt{66}G_v z (3x^4 - 78x^2y^2 + 20x^2z^2 + 3y^4 + 20y^2z^2 - 4z^4)}{88} - \frac{21\sqrt{66}G_{xy}xyz (x - y) (x + y)}{44} \\ & - \frac{\sqrt{66}G_{xz}x (x^4 + 2x^2y^2 - 12x^2z^2 + y^4 - 12y^2z^2 + 8z^4)}{44} + \frac{\sqrt{66}G_{yz}y (x^4 + 2x^2y^2 - 12x^2z^2 + y^4 - 12y^2z^2 + 8z^4)}{44} \end{aligned}$$