Non-Degenerate Perturbation Theory

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Notation

$$V_{00} = \langle \psi_0 | V | \psi_0 \rangle$$

$$E_{0\alpha} = E_0 - E_\alpha$$

$$\Sigma_{x_1 x_2 \cdots x_n} = \sum_{\alpha_1, \alpha_2, \cdots \alpha_n \neq 0} \frac{V_{0\alpha_1} V_{\alpha_1 \alpha_2} \cdots V_{\alpha_n 0}}{E_{0\alpha_1}^{x_1} E_{0\alpha_2}^{x_2} \cdots E_{0\alpha_n}^{x_n}}$$

Examples

$$\Sigma_1 = \sum_{\alpha \neq 0} \frac{|V_{0\alpha}|^2}{E_{0\alpha}}$$

$$\Sigma_{12} = \sum_{\alpha_1, \alpha_2 \neq 0} \frac{V_{0\alpha_1} V_{\alpha_1 \alpha_2} V_{\alpha_2 0}}{E_{0\alpha_1} E_{0\alpha_2}^2}$$

Energy Corrections

$$\mathrm{Tr}[\Delta_1] = V_{00}$$

$$\mathrm{Tr}[\Delta_2] = \Sigma_1$$

$$\mathrm{Tr}[\Delta_3] = \Sigma_{1,1}$$
$$- V_{00}\Sigma_2$$

$$\mathrm{Tr}[\Delta_4] = -\Sigma_1\Sigma_2 + \Sigma_{1,1,1}$$
$$- V_{00}(\Sigma_{1,2} + \Sigma_{2,1})$$
$$+ V_{00}^2\Sigma_3$$

$$\mathrm{Tr}[\Delta_5] = \Sigma_1\Sigma_{1,2} + \Sigma_1\Sigma_{2,1} + \Sigma_{1,1}\Sigma_2 - \Sigma_{1,1,1,1}$$
$$- V_{00}(-2\Sigma_1\Sigma_3 + \Sigma_{1,1,2} + \Sigma_{1,2,1} - \Sigma_2^2 + \Sigma_{2,1,1})$$
$$+ V_{00}^2(\Sigma_{1,3} + \Sigma_{2,2} + \Sigma_{3,1})$$
$$- V_{00}^3\Sigma_4$$

$$\mathrm{Tr}[\Delta_6] = -\Sigma_1^2\Sigma_3 + \Sigma_1\Sigma_{1,1,2} + \Sigma_1\Sigma_{1,2,1} - \Sigma_1\Sigma_2^2 + \Sigma_1\Sigma_{2,1,1} + \Sigma_{1,1}\Sigma_{1,2} + \Sigma_{1,1}\Sigma_{2,1} + \Sigma_{1,1,1}\Sigma_2 - \Sigma_{1,1,1,1,1}$$
$$+ V_{00}(2\Sigma_1\Sigma_{1,3} + 2\Sigma_1\Sigma_{2,2} + 2\Sigma_1\Sigma_{3,1} + 2\Sigma_{1,1}\Sigma_3 - \Sigma_{1,1,1,2} - \Sigma_{1,1,2,1} + 2\Sigma_{1,2}\Sigma_2 - \Sigma_{1,2,1,1} + 2\Sigma_2\Sigma_{2,1} - \Sigma_{2,1,1,1})$$
$$+ V_{00}^2(-3\Sigma_1\Sigma_4 + \Sigma_{1,1,3} + \Sigma_{1,2,2} + \Sigma_{1,3,1} - 3\Sigma_2\Sigma_3 + \Sigma_{2,1,2} + \Sigma_{2,2,1} + \Sigma_{3,1,1})$$
$$- V_{00}^3(\Sigma_{1,4} + \Sigma_{2,3} + \Sigma_{3,2} + \Sigma_{4,1})$$
$$+ V_{00}^4\Sigma_5$$

$$\mathrm{Tr}[\Delta_7] = -\Sigma_1^2\Sigma_{1,3} - \Sigma_1^2\Sigma_{2,2} - \Sigma_1^2\Sigma_{3,1} - 2\Sigma_1\Sigma_{1,1}\Sigma_3 + \Sigma_1\Sigma_{1,1,1,2} + \Sigma_1\Sigma_{1,1,2,1} - 2\Sigma_1\Sigma_{1,2}\Sigma_2 + \Sigma_1\Sigma_{1,2,1,1} - 2\Sigma_1\Sigma_2\Sigma_{2,1} + \Sigma_1\Sigma_{2,1,1,1}$$
$$+ \Sigma_{1,1}\Sigma_{1,1,2} + \Sigma_{1,1}\Sigma_{1,2,1} - \Sigma_{1,1}\Sigma_2^2 + \Sigma_{1,1}\Sigma_{2,1,1} + \Sigma_{1,1,1}\Sigma_{1,2} + \Sigma_{1,1,1}\Sigma_{2,1} + \Sigma_{1,1,1,1}\Sigma_2 - \Sigma_{1,1,1,1,1,1}$$
$$+ V_{00}(-3\Sigma_1^2\Sigma_4 + 2\Sigma_1\Sigma_{1,1,3} + 2\Sigma_1\Sigma_{1,2,2} + 2\Sigma_1\Sigma_{1,3,1} - 6\Sigma_1\Sigma_2\Sigma_3 + 2\Sigma_1\Sigma_{2,1,2} + 2\Sigma_1\Sigma_{2,2,1} + 2\Sigma_1\Sigma_{3,1,1} + 2\Sigma_{1,1}\Sigma_{1,3} + 2\Sigma_{1,1}\Sigma_{2,2}$$
$$+ 2\Sigma_{1,1}\Sigma_{3,1} + 2\Sigma_{1,1,1}\Sigma_3 - \Sigma_{1,1,1,1,2} - \Sigma_{1,1,1,2,1} + 2\Sigma_{1,1,2}\Sigma_2 - \Sigma_{1,1,2,1,1} + \Sigma_{1,2}^2 + 2\Sigma_{1,2}\Sigma_{2,1} + 2\Sigma_{1,2,1}\Sigma_2 - \Sigma_{1,2,1,1,1} - \Sigma_2^3$$
$$+ 2\Sigma_2\Sigma_{2,1,1} + \Sigma_{2,1}^2 - \Sigma_{2,1,1,1,1})$$
$$+ V_{00}^2(-3\Sigma_1\Sigma_{1,4} - 3\Sigma_1\Sigma_{2,3} - 3\Sigma_1\Sigma_{3,2} - 3\Sigma_1\Sigma_{4,1} - 3\Sigma_{1,1}\Sigma_4 + \Sigma_{1,1,1,3} + \Sigma_{1,1,2,2} + \Sigma_{1,1,3,1} - 3\Sigma_{1,2}\Sigma_3 + \Sigma_{1,2,1,2} + \Sigma_{1,2,2,1}$$
$$- 3\Sigma_{1,3}\Sigma_2 + \Sigma_{1,3,1,1} - 3\Sigma_2\Sigma_{2,2} - 3\Sigma_2\Sigma_{3,1} - 3\Sigma_{2,1}\Sigma_3 + \Sigma_{2,1,1,2} + \Sigma_{2,1,2,1} + \Sigma_{2,2,1,1} + \Sigma_{3,1,1,1})$$
$$- V_{00}^3(-4\Sigma_1\Sigma_5 + \Sigma_{1,1,4} + \Sigma_{1,2,3} + \Sigma_{1,3,2} + \Sigma_{1,4,1} - 4\Sigma_2\Sigma_4 + \Sigma_{2,1,3} + \Sigma_{2,2,2} + \Sigma_{2,3,1} - 2\Sigma_3^2 + \Sigma_{3,1,2} + \Sigma_{3,2,1} + \Sigma_{4,1,1})$$
$$+ V_{00}^4(\Sigma_{1,5} + \Sigma_{2,4} + \Sigma_{3,3} + \Sigma_{4,2} + \Sigma_{5,1})$$

$$- V_{00}^5 \Sigma_6$$

$$\mathrm{Tr}[\Delta_8] = -\Sigma_1^3 \Sigma_4 + \Sigma_1^2 \Sigma_{1,1,3} + \Sigma_1^2 \Sigma_{1,2,2} + \Sigma_1^2 \Sigma_{1,3,1} - 3\Sigma_1^2 \Sigma_2 \Sigma_3 + \Sigma_1^2 \Sigma_{2,1,2} + \Sigma_1^2 \Sigma_{2,2,1} + \Sigma_1^2 \Sigma_{3,1,1} + 2\Sigma_1 \Sigma_{1,1} \Sigma_{1,3} + 2\Sigma_1 \Sigma_{1,1} \Sigma_{2,2}$$

$$+ 2\Sigma_1 \Sigma_{1,1} \Sigma_{3,1} + 2\Sigma_1 \Sigma_{1,1,1} \Sigma_3 - \Sigma_1 \Sigma_{1,1,1,1,2} - \Sigma_1 \Sigma_{1,1,1,2,1} + 2\Sigma_1 \Sigma_{1,1,2} \Sigma_2 - \Sigma_1 \Sigma_{1,1,2,1,1} + \Sigma_1 \Sigma_{1,2}^2 + 2\Sigma_1 \Sigma_{1,2} \Sigma_{2,1} + 2\Sigma_1 \Sigma_{1,2,1} \Sigma_2$$

$$- \Sigma_1 \Sigma_{1,2,1,1,1} - \Sigma_1 \Sigma_2^3 + 2\Sigma_1 \Sigma_2 \Sigma_{2,1,1} + \Sigma_1 \Sigma_{2,1}^2 - \Sigma_1 \Sigma_{2,1,1,1,1} + \Sigma_{1,1}^2 \Sigma_3 - \Sigma_{1,1} \Sigma_{1,1,1,2} - \Sigma_{1,1} \Sigma_{1,1,2,1} + 2\Sigma_{1,1} \Sigma_{1,2} \Sigma_2$$

$$- \Sigma_{1,1} \Sigma_{1,2,1,1} + 2\Sigma_{1,1} \Sigma_2 \Sigma_{2,1} - \Sigma_{1,1} \Sigma_{2,1,1,1} - \Sigma_{1,1,1} \Sigma_{1,1,2} - \Sigma_{1,1,1} \Sigma_{1,2,1} + \Sigma_{1,1,1} \Sigma_2^2 - \Sigma_{1,1,1} \Sigma_{2,1,1} - \Sigma_{1,1,1,1} \Sigma_{1,2} - \Sigma_{1,1,1,1} \Sigma_{2,1}$$

$$- \Sigma_{1,1,1,1,1} \Sigma_2 + \Sigma_{1,1,1,1,1,1,1}$$

$$+ V_{00}(-3\Sigma_1^2 \Sigma_{1,4} - 3\Sigma_1^2 \Sigma_{2,3} - 3\Sigma_1^2 \Sigma_{3,2} - 3\Sigma_1^2 \Sigma_{4,1} - 6\Sigma_1 \Sigma_{1,1} \Sigma_4 + 2\Sigma_1 \Sigma_{1,1,3} + 2\Sigma_1 \Sigma_{1,1,2,2} + 2\Sigma_1 \Sigma_{1,1,3,1} - 6\Sigma_1 \Sigma_{1,2} \Sigma_3$$

$$+ 2\Sigma_1 \Sigma_{1,2,1,2} + 2\Sigma_1 \Sigma_{1,2,2,1} - 6\Sigma_1 \Sigma_{1,3} \Sigma_2 + 2\Sigma_1 \Sigma_{1,3,1,1} - 6\Sigma_1 \Sigma_2 \Sigma_{2,2} - 6\Sigma_1 \Sigma_2 \Sigma_{3,1} - 6\Sigma_1 \Sigma_{2,1} \Sigma_3 + 2\Sigma_1 \Sigma_{2,1,1,2} + 2\Sigma_1 \Sigma_{2,1,2,1}$$

$$+ 2\Sigma_1 \Sigma_{2,2,1,1} + 2\Sigma_1 \Sigma_{3,1,1,1} + 2\Sigma_{1,1} \Sigma_{1,1,3} + 2\Sigma_{1,1} \Sigma_{1,2,2} + 2\Sigma_{1,1} \Sigma_{1,3,1} - 6\Sigma_{1,1} \Sigma_2 \Sigma_3 + 2\Sigma_{1,1} \Sigma_{2,1,2} + 2\Sigma_{1,1} \Sigma_{2,2,1} + 2\Sigma_{1,1} \Sigma_{3,1,1}$$

$$+ 2\Sigma_{1,1,1} \Sigma_{1,3} + 2\Sigma_{1,1,1} \Sigma_{2,2} + 2\Sigma_{1,1,1} \Sigma_{3,1} + 2\Sigma_{1,1,1,1} \Sigma_3 - \Sigma_{1,1,1,1,1,2} - \Sigma_{1,1,1,1,2,1} + 2\Sigma_{1,1,1,2} \Sigma_2 - \Sigma_{1,1,1,2,1,1} + 2\Sigma_{1,1,2} \Sigma_{1,2}$$

$$+ 2\Sigma_{1,1,2} \Sigma_{2,1} + 2\Sigma_{1,1,2,1} \Sigma_2 - \Sigma_{1,1,2,1,1,1} + 2\Sigma_{1,2} \Sigma_{1,2,1} - 3\Sigma_{1,2} \Sigma_2^2 + 2\Sigma_{1,2} \Sigma_{2,1,1} + 2\Sigma_{1,2,1} \Sigma_{2,1} + 2\Sigma_{1,2,1,1} \Sigma_2 - \Sigma_{1,2,1,1,1,1}$$

$$- 3\Sigma_2^2 \Sigma_{2,1} + 2\Sigma_2 \Sigma_{2,1,1,1} + 2\Sigma_{2,1} \Sigma_{2,1,1} - \Sigma_{2,1,1,1,1,1})$$

$$- V_{00}^2(-6\Sigma_1^2 \Sigma_5 + 3\Sigma_1 \Sigma_{1,1,4} + 3\Sigma_1 \Sigma_{1,2,3} + 3\Sigma_1 \Sigma_{1,3,2} + 3\Sigma_1 \Sigma_{1,4,1} - 12\Sigma_1 \Sigma_2 \Sigma_4 + 3\Sigma_1 \Sigma_{2,1,3} + 3\Sigma_1 \Sigma_{2,2,2} + 3\Sigma_1 \Sigma_{2,3,1}$$

$$- 6\Sigma_1 \Sigma_3^2 + 3\Sigma_1 \Sigma_{3,1,2} + 3\Sigma_1 \Sigma_{3,2,1} + 3\Sigma_1 \Sigma_{4,1,1} + 3\Sigma_{1,1} \Sigma_{1,4} + 3\Sigma_{1,1} \Sigma_{2,3} + 3\Sigma_{1,1} \Sigma_{3,2} + 3\Sigma_{1,1} \Sigma_{4,1} + 3\Sigma_{1,1,1} \Sigma_4 - \Sigma_{1,1,1,1,3}$$

$$- \Sigma_{1,1,1,2,2} - \Sigma_{1,1,1,3,1} + 3\Sigma_{1,1,2} \Sigma_3 - \Sigma_{1,1,2,1,2} - \Sigma_{1,1,2,2,1} + 3\Sigma_{1,1,3} \Sigma_2 - \Sigma_{1,1,3,1,1} + 3\Sigma_{1,2} \Sigma_{1,3} + 3\Sigma_{1,2} \Sigma_{2,2} + 3\Sigma_{1,2} \Sigma_{3,1} + 3\Sigma_{1,2,1} \Sigma_3$$

$$- \Sigma_{1,2,1,1,2} - \Sigma_{1,2,1,2,1} + 3\Sigma_{1,2,2} \Sigma_2 - \Sigma_{1,2,2,1,1} + 3\Sigma_{1,3} \Sigma_{2,1} + 3\Sigma_{1,3,1} \Sigma_2 - \Sigma_{1,3,1,1,1} - 6\Sigma_2^2 \Sigma_3 + 3\Sigma_2 \Sigma_{2,1,2} + 3\Sigma_2 \Sigma_{2,2,1}$$

$$+ 3\Sigma_2 \Sigma_{3,1,1} + 3\Sigma_{2,1} \Sigma_{2,2} + 3\Sigma_{2,1} \Sigma_{3,1} + 3\Sigma_{2,1,1} \Sigma_3 - \Sigma_{2,1,1,1,2} - \Sigma_{2,1,1,2,1} - \Sigma_{2,1,2,1,1} - \Sigma_{2,2,1,1,1} - \Sigma_{3,1,1,1,1})$$

$$- V_{00}^3(-4\Sigma_1 \Sigma_{1,5} - 4\Sigma_1 \Sigma_{2,4} - 4\Sigma_1 \Sigma_{3,3} - 4\Sigma_1 \Sigma_{4,2} - 4\Sigma_1 \Sigma_{5,1} - 4\Sigma_{1,1} \Sigma_5 + \Sigma_{1,1,1,4} + \Sigma_{1,1,2,3} + \Sigma_{1,1,3,2} + \Sigma_{1,1,4,1} - 4\Sigma_{1,2} \Sigma_4$$

$$+ \Sigma_{1,2,1,3} + \Sigma_{1,2,2,2} + \Sigma_{1,2,3,1} - 4\Sigma_{1,3} \Sigma_3 + \Sigma_{1,3,1,2} + \Sigma_{1,3,2,1} - 4\Sigma_{1,4} \Sigma_2 + \Sigma_{1,4,1,1} - 4\Sigma_2 \Sigma_{2,3} - 4\Sigma_2 \Sigma_{3,2} - 4\Sigma_2 \Sigma_{4,1} - 4\Sigma_{2,1} \Sigma_4$$

$$+ \Sigma_{2,1,1,3} + \Sigma_{2,1,2,2} + \Sigma_{2,1,3,1} - 4\Sigma_{2,2} \Sigma_3 + \Sigma_{2,2,1,2} + \Sigma_{2,2,2,1} + \Sigma_{2,3,1,1} - 4\Sigma_3 \Sigma_{3,1} + \Sigma_{3,1,1,2} + \Sigma_{3,1,2,1} + \Sigma_{3,2,1,1} + \Sigma_{4,1,1,1})$$

$$+ V_{00}^4(-5\Sigma_1 \Sigma_6 + \Sigma_{1,1,5} + \Sigma_{1,2,4} + \Sigma_{1,3,3} + \Sigma_{1,4,2} + \Sigma_{1,5,1} - 5\Sigma_2 \Sigma_5 + \Sigma_{2,1,4} + \Sigma_{2,2,3} + \Sigma_{2,3,2} + \Sigma_{2,4,1} - 5\Sigma_3 \Sigma_4 + \Sigma_{3,1,3} + \Sigma_{3,2,2}$$

$$+ \Sigma_{3,3,1} + \Sigma_{4,1,2} + \Sigma_{4,2,1} + \Sigma_{5,1,1})$$

$$- V_{00}^5(\Sigma_{1,6} + \Sigma_{2,5} + \Sigma_{3,4} + \Sigma_{4,3} + \Sigma_{5,2} + \Sigma_{6,1})$$

$$+ V_{00}^6 \Sigma_7$$

$$\mathrm{Tr}[\Delta_9] = -\Sigma_1^3 \Sigma_{1,4} - \Sigma_1^3 \Sigma_{2,3} - \Sigma_1^3 \Sigma_{3,2} - \Sigma_1^3 \Sigma_{4,1} - 3\Sigma_1^2 \Sigma_{1,1} \Sigma_4 + \Sigma_1^2 \Sigma_{1,1,1,3} + \Sigma_1^2 \Sigma_{1,1,2,2} + \Sigma_1^2 \Sigma_{1,1,3,1} - 3\Sigma_1^2 \Sigma_{1,2} \Sigma_3 + \Sigma_1^2 \Sigma_{1,2,1,2}$$

$$+ \Sigma_1^2 \Sigma_{1,2,2,1} - 3\Sigma_1^2 \Sigma_{1,3} \Sigma_2 + \Sigma_1^2 \Sigma_{1,3,1,1} - 3\Sigma_1^2 \Sigma_2 \Sigma_{2,2} - 3\Sigma_1^2 \Sigma_2 \Sigma_{3,1} - 3\Sigma_1^2 \Sigma_{2,1} \Sigma_3 + \Sigma_1^2 \Sigma_{2,1,1,2} + \Sigma_1^2 \Sigma_{2,1,2,1} + \Sigma_1^2 \Sigma_{2,2,1,1}$$

$$+ \Sigma_1^2 \Sigma_{3,1,1,1} + 2\Sigma_1 \Sigma_{1,1} \Sigma_{1,1,3} + 2\Sigma_1 \Sigma_{1,1} \Sigma_{1,2,2} + 2\Sigma_1 \Sigma_{1,1} \Sigma_{1,3,1} - 6\Sigma_1 \Sigma_{1,1} \Sigma_2 \Sigma_3 + 2\Sigma_1 \Sigma_{1,1} \Sigma_{2,1,2} + 2\Sigma_1 \Sigma_{1,1} \Sigma_{2,2,1}$$

$$+ 2\Sigma_1\Sigma_{1,1}\Sigma_{3,1,1} + 2\Sigma_1\Sigma_{1,1,1}\Sigma_{1,3} + 2\Sigma_1\Sigma_{1,1,1}\Sigma_{2,2} + 2\Sigma_1\Sigma_{1,1,1}\Sigma_{3,1} + 2\Sigma_1\Sigma_{1,1,1,1}\Sigma_3 - \Sigma_1\Sigma_{1,1,1,1,1,2} - \Sigma_1\Sigma_{1,1,1,1,2,1}$$

$$+ 2\Sigma_1\Sigma_{1,1,1,2}\Sigma_2 - \Sigma_1\Sigma_{1,1,1,2,1,1} + 2\Sigma_1\Sigma_{1,1,2}\Sigma_{1,2} + 2\Sigma_1\Sigma_{1,1,2}\Sigma_{2,1} + 2\Sigma_1\Sigma_{1,1,2,1}\Sigma_2 - \Sigma_1\Sigma_{1,1,2,1,1,1} + 2\Sigma_1\Sigma_{1,2}\Sigma_{1,2,1}$$

$$- 3\Sigma_1\Sigma_{1,2}\Sigma_2^2 + 2\Sigma_1\Sigma_{1,2}\Sigma_{2,1,1} + 2\Sigma_1\Sigma_{1,2,1}\Sigma_{2,1} + 2\Sigma_1\Sigma_{1,2,1,1}\Sigma_2 - \Sigma_1\Sigma_{1,2,1,1,1,1} - 3\Sigma_1\Sigma_2^2\Sigma_{2,1} + 2\Sigma_1\Sigma_2\Sigma_{2,1,1,1}$$

$$+ 2\Sigma_1\Sigma_{2,1}\Sigma_{2,1,1} - \Sigma_1\Sigma_{2,1,1,1,1,1} + \Sigma_{1,1}^2\Sigma_{1,3} + \Sigma_{1,1}^2\Sigma_{2,2} + \Sigma_{1,1}^2\Sigma_{3,1} + 2\Sigma_{1,1}\Sigma_{1,1,1}\Sigma_3 - \Sigma_{1,1}\Sigma_{1,1,1,1,2} - \Sigma_{1,1}\Sigma_{1,1,1,2,1}$$

$$+ 2\Sigma_{1,1}\Sigma_{1,1,2}\Sigma_2 - \Sigma_{1,1}\Sigma_{1,1,2,1,1} + \Sigma_{1,1}\Sigma_{1,2}^2 + 2\Sigma_{1,1}\Sigma_{1,2}\Sigma_{2,1} + 2\Sigma_{1,1}\Sigma_{1,2,1}\Sigma_2 - \Sigma_{1,1}\Sigma_{1,2,1,1,1} - \Sigma_{1,1}\Sigma_2^3 + 2\Sigma_{1,1}\Sigma_2\Sigma_{2,1,1}$$

$$+ \Sigma_{1,1}\Sigma_{2,1}^2 - \Sigma_{1,1}\Sigma_{2,1,1,1,1} - \Sigma_{1,1,1}\Sigma_{1,1,1,2} - \Sigma_{1,1,1}\Sigma_{1,1,2,1} + 2\Sigma_{1,1,1}\Sigma_{1,2}\Sigma_2 - \Sigma_{1,1,1}\Sigma_{1,2,1,1} + 2\Sigma_{1,1,1}\Sigma_2\Sigma_{2,1} - \Sigma_{1,1,1}\Sigma_{2,1,1,1}$$

$$- \Sigma_{1,1,1,1}\Sigma_{1,1,2} - \Sigma_{1,1,1,1}\Sigma_{1,2,1} + \Sigma_{1,1,1,1}\Sigma_2^2 - \Sigma_{1,1,1,1}\Sigma_{2,1,1} - \Sigma_{1,1,1,1,1}\Sigma_{1,2} - \Sigma_{1,1,1,1,1}\Sigma_{2,1} - \Sigma_{1,1,1,1,1,1}\Sigma_2 + \Sigma_{1,1,1,1,1,1,1,1}$$

$$+ V_{00}(4\Sigma_1^3\Sigma_5 - 3\Sigma_1^2\Sigma_{1,1,4} - 3\Sigma_1^2\Sigma_{1,2,3} - 3\Sigma_1^2\Sigma_{1,3,2} - 3\Sigma_1^2\Sigma_{1,4,1} + 12\Sigma_1^2\Sigma_2\Sigma_4 - 3\Sigma_1^2\Sigma_{2,1,3} - 3\Sigma_1^2\Sigma_{2,2,2} - 3\Sigma_1^2\Sigma_{2,3,1}$$

$$+ 6\Sigma_1^2\Sigma_3^2 - 3\Sigma_1^2\Sigma_{3,1,2} - 3\Sigma_1^2\Sigma_{3,2,1} - 3\Sigma_1^2\Sigma_{4,1,1} - 6\Sigma_1\Sigma_{1,1}\Sigma_{1,4} - 6\Sigma_1\Sigma_{1,1}\Sigma_{2,3} - 6\Sigma_1\Sigma_{1,1}\Sigma_{3,2} - 6\Sigma_1\Sigma_{1,1}\Sigma_{4,1} - 6\Sigma_1\Sigma_{1,1,1}\Sigma_4$$

$$+ 2\Sigma_1\Sigma_{1,1,1,1,3} + 2\Sigma_1\Sigma_{1,1,1,2,2} + 2\Sigma_1\Sigma_{1,1,1,3,1} - 6\Sigma_1\Sigma_{1,1,2}\Sigma_3 + 2\Sigma_1\Sigma_{1,1,2,1,2} + 2\Sigma_1\Sigma_{1,1,2,2,1} - 6\Sigma_1\Sigma_{1,1,3}\Sigma_2 + 2\Sigma_1\Sigma_{1,1,3,1,1}$$

$$- 6\Sigma_1\Sigma_{1,2}\Sigma_{1,3} - 6\Sigma_1\Sigma_{1,2}\Sigma_{2,2} - 6\Sigma_1\Sigma_{1,2}\Sigma_{3,1} - 6\Sigma_1\Sigma_{1,2,1}\Sigma_3 + 2\Sigma_1\Sigma_{1,2,1,1,2} + 2\Sigma_1\Sigma_{1,2,1,2,1} - 6\Sigma_1\Sigma_{1,2,2}\Sigma_2 + 2\Sigma_1\Sigma_{1,2,2,1,1}$$

$$- 6\Sigma_1\Sigma_{1,3}\Sigma_{2,1} - 6\Sigma_1\Sigma_{1,3,1}\Sigma_2 + 2\Sigma_1\Sigma_{1,3,1,1,1} + 12\Sigma_1\Sigma_2^2\Sigma_3 - 6\Sigma_1\Sigma_2\Sigma_{2,1,2} - 6\Sigma_1\Sigma_2\Sigma_{2,2,1} - 6\Sigma_1\Sigma_2\Sigma_{3,1,1} - 6\Sigma_1\Sigma_{2,1}\Sigma_{2,2}$$

$$- 6\Sigma_1\Sigma_{2,1}\Sigma_{3,1} - 6\Sigma_1\Sigma_{2,1,1}\Sigma_3 + 2\Sigma_1\Sigma_{2,1,1,1,2} + 2\Sigma_1\Sigma_{2,1,1,2,1} + 2\Sigma_1\Sigma_{2,1,2,1,1} + 2\Sigma_1\Sigma_{2,2,1,1,1} + 2\Sigma_1\Sigma_{3,1,1,1,1} - 3\Sigma_{1,1}^2\Sigma_4$$

$$+ 2\Sigma_{1,1}\Sigma_{1,1,1,3} + 2\Sigma_{1,1}\Sigma_{1,1,2,2} + 2\Sigma_{1,1}\Sigma_{1,1,3,1} - 6\Sigma_{1,1}\Sigma_{1,2}\Sigma_3 + 2\Sigma_{1,1}\Sigma_{1,2,1,2} + 2\Sigma_{1,1}\Sigma_{1,2,2,1} - 6\Sigma_{1,1}\Sigma_{1,3}\Sigma_2$$

$$+ 2\Sigma_{1,1}\Sigma_{1,3,1,1} - 6\Sigma_{1,1}\Sigma_2\Sigma_{2,2} - 6\Sigma_{1,1}\Sigma_2\Sigma_{3,1} - 6\Sigma_{1,1}\Sigma_{2,1}\Sigma_3 + 2\Sigma_{1,1}\Sigma_{2,1,1,2} + 2\Sigma_{1,1}\Sigma_{2,1,2,1} + 2\Sigma_{1,1}\Sigma_{2,2,1,1}$$

$$+ 2\Sigma_{1,1}\Sigma_{3,1,1,1} + 2\Sigma_{1,1,1}\Sigma_{1,1,3} + 2\Sigma_{1,1,1}\Sigma_{1,2,2} + 2\Sigma_{1,1,1}\Sigma_{1,3,1} - 6\Sigma_{1,1,1}\Sigma_2\Sigma_3 + 2\Sigma_{1,1,1}\Sigma_{2,1,2} + 2\Sigma_{1,1,1}\Sigma_{2,2,1}$$

$$+ 2\Sigma_{1,1,1}\Sigma_{3,1,1} + 2\Sigma_{1,1,1,1}\Sigma_{1,3} + 2\Sigma_{1,1,1,1}\Sigma_{2,2} + 2\Sigma_{1,1,1,1}\Sigma_{3,1} + 2\Sigma_{1,1,1,1,1}\Sigma_3 - \Sigma_{1,1,1,1,1,1,2} - \Sigma_{1,1,1,1,1,2,1} + 2\Sigma_{1,1,1,1,2}\Sigma_2$$

$$- \Sigma_{1,1,1,1,2,1,1} + 2\Sigma_{1,1,1,2}\Sigma_{1,2} + 2\Sigma_{1,1,1,2}\Sigma_{2,1} + 2\Sigma_{1,1,1,2,1}\Sigma_2 - \Sigma_{1,1,1,2,1,1,1} + \Sigma_{1,1,2}^2 + 2\Sigma_{1,1,2}\Sigma_{1,2,1} - 3\Sigma_{1,1,2}\Sigma_2^2$$

$$+ 2\Sigma_{1,1,2}\Sigma_{2,1,1} + 2\Sigma_{1,1,2,1}\Sigma_{1,2} + 2\Sigma_{1,1,2,1}\Sigma_{2,1} + 2\Sigma_{1,1,2,1,1}\Sigma_2 - \Sigma_{1,1,2,1,1,1,1} - 3\Sigma_{1,2}^2\Sigma_2 + 2\Sigma_{1,2}\Sigma_{1,2,1,1} - 6\Sigma_{1,2}\Sigma_2\Sigma_{2,1}$$

$$+ 2\Sigma_{1,2}\Sigma_{2,1,1,1} + \Sigma_{1,2,1}^2 - 3\Sigma_{1,2,1}\Sigma_2^2 + 2\Sigma_{1,2,1}\Sigma_{2,1,1} + 2\Sigma_{1,2,1,1}\Sigma_{2,1} + 2\Sigma_{1,2,1,1,1}\Sigma_2 - \Sigma_{1,2,1,1,1,1,1} + \Sigma_2^4 - 3\Sigma_2^2\Sigma_{2,1,1}$$

$$- 3\Sigma_2\Sigma_{2,1}^2 + 2\Sigma_2\Sigma_{2,1,1,1,1} + 2\Sigma_{2,1}\Sigma_{2,1,1,1} + \Sigma_{2,1,1}^2 - \Sigma_{2,1,1,1,1,1,1})$$

$$- V_{00}^2(-6\Sigma_1^2\Sigma_{1,5} - 6\Sigma_1^2\Sigma_{2,4} - 6\Sigma_1^2\Sigma_{3,3} - 6\Sigma_1^2\Sigma_{4,2} - 6\Sigma_1^2\Sigma_{5,1} - 12\Sigma_1\Sigma_{1,1}\Sigma_5 + 3\Sigma_1\Sigma_{1,1,1,4} + 3\Sigma_1\Sigma_{1,1,2,3} + 3\Sigma_1\Sigma_{1,1,3,2}$$

$$+ 3\Sigma_1\Sigma_{1,1,4,1} - 12\Sigma_1\Sigma_{1,2}\Sigma_4 + 3\Sigma_1\Sigma_{1,2,1,3} + 3\Sigma_1\Sigma_{1,2,2,2} + 3\Sigma_1\Sigma_{1,2,3,1} - 12\Sigma_1\Sigma_{1,3}\Sigma_3 + 3\Sigma_1\Sigma_{1,3,1,2} + 3\Sigma_1\Sigma_{1,3,2,1} - 12\Sigma_1\Sigma_{1,4}\Sigma_2$$

$$+ 3\Sigma_1\Sigma_{1,4,1,1} - 12\Sigma_1\Sigma_2\Sigma_{2,3} - 12\Sigma_1\Sigma_2\Sigma_{3,2} - 12\Sigma_1\Sigma_2\Sigma_{4,1} - 12\Sigma_1\Sigma_{2,1}\Sigma_4 + 3\Sigma_1\Sigma_{2,1,1,3} + 3\Sigma_1\Sigma_{2,1,2,2} + 3\Sigma_1\Sigma_{2,1,3,1}$$

$$- 12\Sigma_1\Sigma_{2,2}\Sigma_3 + 3\Sigma_1\Sigma_{2,2,1,2} + 3\Sigma_1\Sigma_{2,2,2,1} + 3\Sigma_1\Sigma_{2,3,1,1} - 12\Sigma_1\Sigma_3\Sigma_{3,1} + 3\Sigma_1\Sigma_{3,1,1,2} + 3\Sigma_1\Sigma_{3,1,2,1} + 3\Sigma_1\Sigma_{3,2,1,1}$$

$$+ 3\Sigma_1\Sigma_{4,1,1,1} + 3\Sigma_{1,1}\Sigma_{1,1,4} + 3\Sigma_{1,1}\Sigma_{1,2,3} + 3\Sigma_{1,1}\Sigma_{1,3,2} + 3\Sigma_{1,1}\Sigma_{1,4,1} - 12\Sigma_{1,1}\Sigma_2\Sigma_4 + 3\Sigma_{1,1}\Sigma_{2,1,3} + 3\Sigma_{1,1}\Sigma_{2,2,2}$$

$$\begin{aligned}
&+ 3\Sigma_{1,1}\Sigma_{2,3,1} - 6\Sigma_{1,1}\Sigma_3^2 + 3\Sigma_{1,1}\Sigma_{3,1,2} + 3\Sigma_{1,1}\Sigma_{3,2,1} + 3\Sigma_{1,1}\Sigma_{4,1,1} + 3\Sigma_{1,1,1}\Sigma_{1,4} + 3\Sigma_{1,1,1}\Sigma_{2,3} + 3\Sigma_{1,1,1}\Sigma_{3,2} + 3\Sigma_{1,1,1}\Sigma_{4,1} \\
&+ 3\Sigma_{1,1,1,1}\Sigma_4 - \Sigma_{1,1,1,1,1,3} - \Sigma_{1,1,1,1,2,2} - \Sigma_{1,1,1,1,3,1} + 3\Sigma_{1,1,1,2}\Sigma_3 - \Sigma_{1,1,1,2,1,2} - \Sigma_{1,1,1,2,2,1} + 3\Sigma_{1,1,1,3}\Sigma_2 - \Sigma_{1,1,1,3,1,1} \\
&+ 3\Sigma_{1,1,2}\Sigma_{1,3} + 3\Sigma_{1,1,2}\Sigma_{2,2} + 3\Sigma_{1,1,2}\Sigma_{3,1} + 3\Sigma_{1,1,2,1}\Sigma_3 - \Sigma_{1,1,2,1,1,2} - \Sigma_{1,1,2,1,2,1} + 3\Sigma_{1,1,2,2}\Sigma_2 - \Sigma_{1,1,2,2,1,1} + 3\Sigma_{1,1,3}\Sigma_{1,2} \\
&+ 3\Sigma_{1,1,3}\Sigma_{2,1} + 3\Sigma_{1,1,3,1}\Sigma_2 - \Sigma_{1,1,3,1,1,1} + 3\Sigma_{1,2}\Sigma_{1,2,2} + 3\Sigma_{1,2}\Sigma_{1,3,1} - 12\Sigma_{1,2}\Sigma_2\Sigma_3 + 3\Sigma_{1,2}\Sigma_{2,1,2} + 3\Sigma_{1,2}\Sigma_{2,2,1} \\
&+ 3\Sigma_{1,2}\Sigma_{3,1,1} + 3\Sigma_{1,2,1}\Sigma_{1,3} + 3\Sigma_{1,2,1}\Sigma_{2,2} + 3\Sigma_{1,2,1}\Sigma_{3,1} + 3\Sigma_{1,2,1,1}\Sigma_3 - \Sigma_{1,2,1,1,1,2} - \Sigma_{1,2,1,1,2,1} + 3\Sigma_{1,2,1,2}\Sigma_2 - \Sigma_{1,2,1,2,1,1} \\
&+ 3\Sigma_{1,2,2}\Sigma_{2,1} + 3\Sigma_{1,2,2,1}\Sigma_2 - \Sigma_{1,2,2,1,1,1} - 6\Sigma_{1,3}\Sigma_2^2 + 3\Sigma_{1,3}\Sigma_{2,1,1} + 3\Sigma_{1,3,1}\Sigma_{2,1} + 3\Sigma_{1,3,1,1}\Sigma_2 - \Sigma_{1,3,1,1,1,1} - 6\Sigma_2^2\Sigma_{2,2} \\
&- 6\Sigma_2^2\Sigma_{3,1} - 12\Sigma_2\Sigma_{2,1}\Sigma_3 + 3\Sigma_2\Sigma_{2,1,1,2} + 3\Sigma_2\Sigma_{2,1,2,1} + 3\Sigma_2\Sigma_{2,2,1,1} + 3\Sigma_2\Sigma_{3,1,1,1} + 3\Sigma_{2,1}\Sigma_{2,1,2} + 3\Sigma_{2,1}\Sigma_{2,2,1} \\
&+ 3\Sigma_{2,1}\Sigma_{3,1,1} + 3\Sigma_{2,1,1}\Sigma_{2,2} + 3\Sigma_{2,1,1}\Sigma_{3,1} + 3\Sigma_{2,1,1,1}\Sigma_3 - \Sigma_{2,1,1,1,1,2} - \Sigma_{2,1,1,1,2,1} - \Sigma_{2,1,1,2,1,1} - \Sigma_{2,1,2,1,1,1} - \Sigma_{2,2,1,1,1,1} \\
&- \Sigma_{3,1,1,1,1,1}) \\
&+ V_{00}^3(-10\Sigma_1^2\Sigma_6 + 4\Sigma_1\Sigma_{1,1,5} + 4\Sigma_1\Sigma_{1,2,4} + 4\Sigma_1\Sigma_{1,3,3} + 4\Sigma_1\Sigma_{1,4,2} + 4\Sigma_1\Sigma_{1,5,1} - 20\Sigma_1\Sigma_2\Sigma_5 + 4\Sigma_1\Sigma_{2,1,4} + 4\Sigma_1\Sigma_{2,2,3} \\
&+ 4\Sigma_1\Sigma_{2,3,2} + 4\Sigma_1\Sigma_{2,4,1} - 20\Sigma_1\Sigma_3\Sigma_4 + 4\Sigma_1\Sigma_{3,1,3} + 4\Sigma_1\Sigma_{3,2,2} + 4\Sigma_1\Sigma_{3,3,1} + 4\Sigma_1\Sigma_{4,1,2} + 4\Sigma_1\Sigma_{4,2,1} + 4\Sigma_1\Sigma_{5,1,1} + 4\Sigma_{1,1}\Sigma_{1,5} \\
&+ 4\Sigma_{1,1}\Sigma_{2,4} + 4\Sigma_{1,1}\Sigma_{3,3} + 4\Sigma_{1,1}\Sigma_{4,2} + 4\Sigma_{1,1}\Sigma_{5,1} + 4\Sigma_{1,1,1}\Sigma_5 - \Sigma_{1,1,1,1,4} - \Sigma_{1,1,1,2,3} - \Sigma_{1,1,1,3,2} - \Sigma_{1,1,1,4,1} + 4\Sigma_{1,1,2}\Sigma_4 \\
&- \Sigma_{1,1,2,1,3} - \Sigma_{1,1,2,2,2} - \Sigma_{1,1,2,3,1} + 4\Sigma_{1,1,3}\Sigma_3 - \Sigma_{1,1,3,1,2} - \Sigma_{1,1,3,2,1} + 4\Sigma_{1,1,4}\Sigma_2 - \Sigma_{1,1,4,1,1} + 4\Sigma_{1,2}\Sigma_{1,4} + 4\Sigma_{1,2}\Sigma_{2,3} + 4\Sigma_{1,2}\Sigma_{3,2} \\
&+ 4\Sigma_{1,2}\Sigma_{4,1} + 4\Sigma_{1,2,1}\Sigma_4 - \Sigma_{1,2,1,1,3} - \Sigma_{1,2,1,2,2} - \Sigma_{1,2,1,3,1} + 4\Sigma_{1,2,2}\Sigma_3 - \Sigma_{1,2,2,1,2} - \Sigma_{1,2,2,2,1} + 4\Sigma_{1,2,3}\Sigma_2 - \Sigma_{1,2,3,1,1} \\
&+ 2\Sigma_{1,3}^2 + 4\Sigma_{1,3}\Sigma_{2,2} + 4\Sigma_{1,3}\Sigma_{3,1} + 4\Sigma_{1,3,1}\Sigma_3 - \Sigma_{1,3,1,1,2} - \Sigma_{1,3,1,2,1} + 4\Sigma_{1,3,2}\Sigma_2 - \Sigma_{1,3,2,1,1} + 4\Sigma_{1,4}\Sigma_{2,1} + 4\Sigma_{1,4,1}\Sigma_2 \\
&- \Sigma_{1,4,1,1,1} - 10\Sigma_2^2\Sigma_4 + 4\Sigma_2\Sigma_{2,1,3} + 4\Sigma_2\Sigma_{2,2,2} + 4\Sigma_2\Sigma_{2,3,1} - 10\Sigma_2\Sigma_3^2 + 4\Sigma_2\Sigma_{3,1,2} + 4\Sigma_2\Sigma_{3,2,1} + 4\Sigma_2\Sigma_{4,1,1} + 4\Sigma_{2,1}\Sigma_{2,3} \\
&+ 4\Sigma_{2,1}\Sigma_{3,2} + 4\Sigma_{2,1}\Sigma_{4,1} + 4\Sigma_{2,1,1}\Sigma_4 - \Sigma_{2,1,1,1,3} - \Sigma_{2,1,1,2,2} - \Sigma_{2,1,1,3,1} + 4\Sigma_{2,1,2}\Sigma_3 - \Sigma_{2,1,2,1,2} - \Sigma_{2,1,2,2,1} - \Sigma_{2,1,3,1,1} \\
&+ 2\Sigma_{2,2}^2 + 4\Sigma_{2,2}\Sigma_{3,1} + 4\Sigma_{2,2,1}\Sigma_3 - \Sigma_{2,2,1,1,2} - \Sigma_{2,2,1,2,1} - \Sigma_{2,2,2,1,1} - \Sigma_{2,3,1,1,1} + 4\Sigma_3\Sigma_{3,1,1} + 2\Sigma_{3,1}^2 - \Sigma_{3,1,1,1,2} - \Sigma_{3,1,1,2,1} \\
&- \Sigma_{3,1,2,1,1} - \Sigma_{3,2,1,1,1} - \Sigma_{4,1,1,1,1}) \\
&+ V_{00}^4(-5\Sigma_1\Sigma_{1,6} - 5\Sigma_1\Sigma_{2,5} - 5\Sigma_1\Sigma_{3,4} - 5\Sigma_1\Sigma_{4,3} - 5\Sigma_1\Sigma_{5,2} - 5\Sigma_1\Sigma_{6,1} - 5\Sigma_{1,1}\Sigma_6 + \Sigma_{1,1,1,5} + \Sigma_{1,1,2,4} + \Sigma_{1,1,3,3} + \Sigma_{1,1,4,2} \\
&+ \Sigma_{1,1,5,1} - 5\Sigma_{1,2}\Sigma_5 + \Sigma_{1,2,1,4} + \Sigma_{1,2,2,3} + \Sigma_{1,2,3,2} + \Sigma_{1,2,4,1} - 5\Sigma_{1,3}\Sigma_4 + \Sigma_{1,3,1,3} + \Sigma_{1,3,2,2} + \Sigma_{1,3,3,1} - 5\Sigma_{1,4}\Sigma_3 + \Sigma_{1,4,1,2} \\
&+ \Sigma_{1,4,2,1} - 5\Sigma_{1,5}\Sigma_2 + \Sigma_{1,5,1,1} - 5\Sigma_2\Sigma_{2,4} - 5\Sigma_2\Sigma_{3,3} - 5\Sigma_2\Sigma_{4,2} - 5\Sigma_2\Sigma_{5,1} - 5\Sigma_{2,1}\Sigma_5 + \Sigma_{2,1,1,4} + \Sigma_{2,1,2,3} + \Sigma_{2,1,3,2} + \Sigma_{2,1,4,1} \\
&- 5\Sigma_{2,2}\Sigma_4 + \Sigma_{2,2,1,3} + \Sigma_{2,2,2,2} + \Sigma_{2,2,3,1} - 5\Sigma_{2,3}\Sigma_3 + \Sigma_{2,3,1,2} + \Sigma_{2,3,2,1} + \Sigma_{2,4,1,1} - 5\Sigma_3\Sigma_{3,2} - 5\Sigma_3\Sigma_{4,1} - 5\Sigma_{3,1}\Sigma_4 + \Sigma_{3,1,1,3} \\
&+ \Sigma_{3,1,2,2} + \Sigma_{3,1,3,1} + \Sigma_{3,2,1,2} + \Sigma_{3,2,2,1} + \Sigma_{3,3,1,1} + \Sigma_{4,1,1,2} + \Sigma_{4,1,2,1} + \Sigma_{4,2,1,1} + \Sigma_{5,1,1,1}) \\
&- V_{00}^5(-6\Sigma_1\Sigma_7 + \Sigma_{1,1,6} + \Sigma_{1,2,5} + \Sigma_{1,3,4} + \Sigma_{1,4,3} + \Sigma_{1,5,2} + \Sigma_{1,6,1} - 6\Sigma_2\Sigma_6 + \Sigma_{2,1,5} + \Sigma_{2,2,4} + \Sigma_{2,3,3} + \Sigma_{2,4,2} + \Sigma_{2,5,1} - 6\Sigma_3\Sigma_5 \\
&+ \Sigma_{3,1,4} + \Sigma_{3,2,3} + \Sigma_{3,3,2} + \Sigma_{3,4,1} - 3\Sigma_4^2 + \Sigma_{4,1,3} + \Sigma_{4,2,2} + \Sigma_{4,3,1} + \Sigma_{5,1,2} + \Sigma_{5,2,1} + \Sigma_{6,1,1}) \\
&+ V_{00}^6(\Sigma_{1,7} + \Sigma_{2,6} + \Sigma_{3,5} + \Sigma_{4,4} + \Sigma_{5,3} + \Sigma_{6,2} + \Sigma_{7,1})
\end{aligned}$$

$$- V_{00}^7 \Sigma_8$$

$$\begin{aligned}
\mathrm{Tr}[\Delta_{10}] = {} & \Sigma_1^4 \Sigma_5 - \Sigma_1^3 \Sigma_{1,1,4} - \Sigma_1^3 \Sigma_{1,2,3} - \Sigma_1^3 \Sigma_{1,3,2} - \Sigma_1^3 \Sigma_{1,4,1} + 4\Sigma_1^3 \Sigma_2 \Sigma_4 - \Sigma_1^3 \Sigma_{2,1,3} - \Sigma_1^3 \Sigma_{2,2,2} - \Sigma_1^3 \Sigma_{2,3,1} + 2\Sigma_1^3 \Sigma_3^2 - \Sigma_1^3 \Sigma_{3,1,2} \\
& - \Sigma_1^3 \Sigma_{3,2,1} - \Sigma_1^3 \Sigma_{4,1,1} - 3\Sigma_1^2 \Sigma_{1,1} \Sigma_{1,4} - 3\Sigma_1^2 \Sigma_{1,1} \Sigma_{2,3} - 3\Sigma_1^2 \Sigma_{1,1} \Sigma_{3,2} - 3\Sigma_1^2 \Sigma_{1,1} \Sigma_{4,1} - 3\Sigma_1^2 \Sigma_{1,1,1} \Sigma_4 + \Sigma_1^2 \Sigma_{1,1,1,1,3} + \Sigma_1^2 \Sigma_{1,1,1,2,2} \\
& + \Sigma_1^2 \Sigma_{1,1,1,3,1} - 3\Sigma_1^2 \Sigma_{1,1,2} \Sigma_3 + \Sigma_1^2 \Sigma_{1,1,2,1,2} + \Sigma_1^2 \Sigma_{1,1,2,2,1} - 3\Sigma_1^2 \Sigma_{1,1,3} \Sigma_2 + \Sigma_1^2 \Sigma_{1,1,3,1,1} - 3\Sigma_1^2 \Sigma_{1,2} \Sigma_{1,3} - 3\Sigma_1^2 \Sigma_{1,2} \Sigma_{2,2} \\
& - 3\Sigma_1^2 \Sigma_{1,2} \Sigma_{3,1} - 3\Sigma_1^2 \Sigma_{1,2,1} \Sigma_3 + \Sigma_1^2 \Sigma_{1,2,1,1,2} + \Sigma_1^2 \Sigma_{1,2,1,2,1} - 3\Sigma_1^2 \Sigma_{1,2,2} \Sigma_2 + \Sigma_1^2 \Sigma_{1,2,2,1,1} - 3\Sigma_1^2 \Sigma_{1,3} \Sigma_{2,1} - 3\Sigma_1^2 \Sigma_{1,3,1} \Sigma_2 \\
& + \Sigma_1^2 \Sigma_{1,3,1,1,1} + 6\Sigma_1^2 \Sigma_2^2 \Sigma_3 - 3\Sigma_1^2 \Sigma_2 \Sigma_{2,1,2} - 3\Sigma_1^2 \Sigma_2 \Sigma_{2,2,1} - 3\Sigma_1^2 \Sigma_2 \Sigma_{3,1,1} - 3\Sigma_1^2 \Sigma_{2,1} \Sigma_{2,2} - 3\Sigma_1^2 \Sigma_{2,1} \Sigma_{3,1} - 3\Sigma_1^2 \Sigma_{2,1,1} \Sigma_3 \\
& + \Sigma_1^2 \Sigma_{2,1,1,1,2} + \Sigma_1^2 \Sigma_{2,1,1,2,1} + \Sigma_1^2 \Sigma_{2,1,2,1,1} + \Sigma_1^2 \Sigma_{2,2,1,1,1} + \Sigma_1^2 \Sigma_{3,1,1,1,1} - 3\Sigma_1 \Sigma_{1,1}^2 \Sigma_4 + 2\Sigma_1 \Sigma_{1,1} \Sigma_{1,1,1,3} + 2\Sigma_1 \Sigma_{1,1} \Sigma_{1,1,2,2} \\
& + 2\Sigma_1 \Sigma_{1,1} \Sigma_{1,1,3,1} - 6\Sigma_1 \Sigma_{1,1} \Sigma_{1,2} \Sigma_3 + 2\Sigma_1 \Sigma_{1,1} \Sigma_{1,2,1,2} + 2\Sigma_1 \Sigma_{1,1} \Sigma_{1,2,2,1} - 6\Sigma_1 \Sigma_{1,1} \Sigma_{1,3} \Sigma_2 + 2\Sigma_1 \Sigma_{1,1} \Sigma_{1,3,1,1} \\
& - 6\Sigma_1 \Sigma_{1,1} \Sigma_2 \Sigma_{2,2} - 6\Sigma_1 \Sigma_{1,1} \Sigma_2 \Sigma_{3,1} - 6\Sigma_1 \Sigma_{1,1} \Sigma_{2,1} \Sigma_3 + 2\Sigma_1 \Sigma_{1,1} \Sigma_{2,1,1,2} + 2\Sigma_1 \Sigma_{1,1} \Sigma_{2,1,2,1} + 2\Sigma_1 \Sigma_{1,1} \Sigma_{2,2,1,1} \\
& + 2\Sigma_1 \Sigma_{1,1} \Sigma_{3,1,1,1} + 2\Sigma_1 \Sigma_{1,1,1} \Sigma_{1,1,3} + 2\Sigma_1 \Sigma_{1,1,1} \Sigma_{1,2,2} + 2\Sigma_1 \Sigma_{1,1,1} \Sigma_{1,3,1} - 6\Sigma_1 \Sigma_{1,1,1} \Sigma_2 \Sigma_3 + 2\Sigma_1 \Sigma_{1,1,1} \Sigma_{2,1,2} \\
& + 2\Sigma_1 \Sigma_{1,1,1} \Sigma_{2,2,1} + 2\Sigma_1 \Sigma_{1,1,1} \Sigma_{3,1,1} + 2\Sigma_1 \Sigma_{1,1,1,1} \Sigma_{1,3} + 2\Sigma_1 \Sigma_{1,1,1,1} \Sigma_{2,2} + 2\Sigma_1 \Sigma_{1,1,1,1} \Sigma_{3,1} + 2\Sigma_1 \Sigma_{1,1,1,1,1} \Sigma_3 \\
& - \Sigma_1 \Sigma_{1,1,1,1,1,1,2} - \Sigma_1 \Sigma_{1,1,1,1,1,2,1} + 2\Sigma_1 \Sigma_{1,1,1,1,2} \Sigma_2 - \Sigma_1 \Sigma_{1,1,1,1,2,1,1} + 2\Sigma_1 \Sigma_{1,1,1,2} \Sigma_{1,2} + 2\Sigma_1 \Sigma_{1,1,1,2} \Sigma_{2,1} \\
& + 2\Sigma_1 \Sigma_{1,1,1,2,1} \Sigma_2 - \Sigma_1 \Sigma_{1,1,1,2,1,1,1} + \Sigma_1 \Sigma_{1,1,2}^2 + 2\Sigma_1 \Sigma_{1,1,2} \Sigma_{1,2,1} - 3\Sigma_1 \Sigma_{1,1,2} \Sigma_2^2 + 2\Sigma_1 \Sigma_{1,1,2} \Sigma_{2,1,1} \\
& + 2\Sigma_1 \Sigma_{1,1,2,1} \Sigma_{1,2} + 2\Sigma_1 \Sigma_{1,1,2,1} \Sigma_{2,1} + 2\Sigma_1 \Sigma_{1,1,2,1,1} \Sigma_2 - \Sigma_1 \Sigma_{1,1,2,1,1,1,1} - 3\Sigma_1 \Sigma_{1,2}^2 \Sigma_2 + 2\Sigma_1 \Sigma_{1,2} \Sigma_{1,2,1,1} \\
& - 6\Sigma_1 \Sigma_{1,2} \Sigma_2 \Sigma_{2,1} + 2\Sigma_1 \Sigma_{1,2} \Sigma_{2,1,1,1} + \Sigma_1 \Sigma_{1,2,1}^2 - 3\Sigma_1 \Sigma_{1,2,1} \Sigma_2^2 + 2\Sigma_1 \Sigma_{1,2,1} \Sigma_{2,1,1} + 2\Sigma_1 \Sigma_{1,2,1,1} \Sigma_{2,1} \\
& + 2\Sigma_1 \Sigma_{1,2,1,1,1} \Sigma_2 - \Sigma_1 \Sigma_{1,2,1,1,1,1,1} + \Sigma_1 \Sigma_2^4 - 3\Sigma_1 \Sigma_2^2 \Sigma_{2,1,1} - 3\Sigma_1 \Sigma_2 \Sigma_{2,1}^2 + 2\Sigma_1 \Sigma_2 \Sigma_{2,1,1,1,1} \\
& + 2\Sigma_1 \Sigma_{2,1} \Sigma_{2,1,1,1} + \Sigma_1 \Sigma_{2,1,1}^2 - \Sigma_1 \Sigma_{2,1,1,1,1,1,1} + \Sigma_{1,1}^2 \Sigma_{1,1,3} + \Sigma_{1,1}^2 \Sigma_{1,2,2} + \Sigma_{1,1}^2 \Sigma_{1,3,1} - 3\Sigma_{1,1}^2 \Sigma_2 \Sigma_3 \\
& + \Sigma_{1,1}^2 \Sigma_{2,1,2} + \Sigma_{1,1}^2 \Sigma_{2,2,1} + \Sigma_{1,1}^2 \Sigma_{3,1,1} + 2\Sigma_{1,1} \Sigma_{1,1,1} \Sigma_{1,3} + 2\Sigma_{1,1} \Sigma_{1,1,1} \Sigma_{2,2} + 2\Sigma_{1,1} \Sigma_{1,1,1} \Sigma_{3,1} \\
& + 2\Sigma_{1,1} \Sigma_{1,1,1,1} \Sigma_3 - \Sigma_{1,1} \Sigma_{1,1,1,1,1,2} - \Sigma_{1,1} \Sigma_{1,1,1,1,2,1} + 2\Sigma_{1,1} \Sigma_{1,1,1,2} \Sigma_2 - \Sigma_{1,1} \Sigma_{1,1,1,2,1,1} + 2\Sigma_{1,1} \Sigma_{1,1,2} \Sigma_{1,2} \\
& + 2\Sigma_{1,1} \Sigma_{1,1,2} \Sigma_{2,1} + 2\Sigma_{1,1} \Sigma_{1,1,2,1} \Sigma_2 - \Sigma_{1,1} \Sigma_{1,1,2,1,1,1} + 2\Sigma_{1,1} \Sigma_{1,2} \Sigma_{1,2,1} - 3\Sigma_{1,1} \Sigma_{1,2} \Sigma_2^2 + 2\Sigma_{1,1} \Sigma_{1,2} \Sigma_{2,1,1} \\
& + 2\Sigma_{1,1} \Sigma_{1,2,1} \Sigma_{2,1} + 2\Sigma_{1,1} \Sigma_{1,2,1,1} \Sigma_2 - \Sigma_{1,1} \Sigma_{1,2,1,1,1,1} - 3\Sigma_{1,1} \Sigma_2^2 \Sigma_{2,1} + 2\Sigma_{1,1} \Sigma_2 \Sigma_{2,1,1,1} + 2\Sigma_{1,1} \Sigma_{2,1} \Sigma_{2,1,1} \\
& - \Sigma_{1,1} \Sigma_{2,1,1,1,1,1} + \Sigma_{1,1,1}^2 \Sigma_3 - \Sigma_{1,1,1} \Sigma_{1,1,1,1,2} - \Sigma_{1,1,1} \Sigma_{1,1,1,2,1} + 2\Sigma_{1,1,1} \Sigma_{1,1,2} \Sigma_2 - \Sigma_{1,1,1} \Sigma_{1,1,2,1,1} \\
& + \Sigma_{1,1,1} \Sigma_{1,2}^2 + 2\Sigma_{1,1,1} \Sigma_{1,2} \Sigma_{2,1} + 2\Sigma_{1,1,1} \Sigma_{1,2,1} \Sigma_2 - \Sigma_{1,1,1} \Sigma_{1,2,1,1,1} - \Sigma_{1,1,1} \Sigma_2^3 + 2\Sigma_{1,1,1} \Sigma_2 \Sigma_{2,1,1} \\
& + \Sigma_{1,1,1} \Sigma_{2,1}^2 - \Sigma_{1,1,1} \Sigma_{2,1,1,1,1} - \Sigma_{1,1,1,1} \Sigma_{1,1,1,2} - \Sigma_{1,1,1,1} \Sigma_{1,1,2,1} + 2\Sigma_{1,1,1,1} \Sigma_{1,2} \Sigma_2 - \Sigma_{1,1,1,1} \Sigma_{1,2,1,1} \\
& + 2\Sigma_{1,1,1,1} \Sigma_2 \Sigma_{2,1} - \Sigma_{1,1,1,1} \Sigma_{2,1,1,1} - \Sigma_{1,1,1,1,1} \Sigma_{1,1,2} - \Sigma_{1,1,1,1,1} \Sigma_{1,2,1} + \Sigma_{1,1,1,1,1} \Sigma_2^2 - \Sigma_{1,1,1,1,1} \Sigma_{2,1,1} \\
& - \Sigma_{1,1,1,1,1,1} \Sigma_{1,2} - \Sigma_{1,1,1,1,1,1} \Sigma_{2,1} - \Sigma_{1,1,1,1,1,1,1} \Sigma_2 + \Sigma_{1,1,1,1,1,1,1,1}
\end{aligned}$$

$$
\begin{aligned}
- V_{00}(&-4\Sigma_1^3\Sigma_{1,5} - 4\Sigma_1^3\Sigma_{2,4} - 4\Sigma_1^3\Sigma_{3,3} - 4\Sigma_1^3\Sigma_{4,2} - 4\Sigma_1^3\Sigma_{5,1} - 12\Sigma_1^2\Sigma_{1,1}\Sigma_5 + 3\Sigma_1^2\Sigma_{1,1,1,4} + 3\Sigma_1^2\Sigma_{1,1,2,3} + 3\Sigma_1^2\Sigma_{1,1,3,2} \\
&+ 3\Sigma_1^2\Sigma_{1,1,4,1} - 12\Sigma_1^2\Sigma_{1,2}\Sigma_4 + 3\Sigma_1^2\Sigma_{1,2,1,3} + 3\Sigma_1^2\Sigma_{1,2,2,2} + 3\Sigma_1^2\Sigma_{1,2,3,1} - 12\Sigma_1^2\Sigma_{1,3}\Sigma_3 + 3\Sigma_1^2\Sigma_{1,3,1,2} + 3\Sigma_1^2\Sigma_{1,3,2,1} - 12\Sigma_1^2\Sigma_{1,4}\Sigma_2 \\
&+ 3\Sigma_1^2\Sigma_{1,4,1,1} - 12\Sigma_1^2\Sigma_2\Sigma_{2,3} - 12\Sigma_1^2\Sigma_2\Sigma_{3,2} - 12\Sigma_1^2\Sigma_2\Sigma_{4,1} - 12\Sigma_1^2\Sigma_{2,1}\Sigma_4 + 3\Sigma_1^2\Sigma_{2,1,1,3} + 3\Sigma_1^2\Sigma_{2,1,2,2} + 3\Sigma_1^2\Sigma_{2,1,3,1} \\
&- 12\Sigma_1^2\Sigma_{2,2}\Sigma_3 + 3\Sigma_1^2\Sigma_{2,2,1,2} + 3\Sigma_1^2\Sigma_{2,2,2,1} + 3\Sigma_1^2\Sigma_{2,3,1,1} - 12\Sigma_1^2\Sigma_3\Sigma_{3,1} + 3\Sigma_1^2\Sigma_{3,1,1,2} + 3\Sigma_1^2\Sigma_{3,1,2,1} + 3\Sigma_1^2\Sigma_{3,2,1,1} \\
&+ 3\Sigma_1^2\Sigma_{4,1,1,1} + 6\Sigma_1\Sigma_{1,1}\Sigma_{1,1,4} + 6\Sigma_1\Sigma_{1,1}\Sigma_{1,2,3} + 6\Sigma_1\Sigma_{1,1}\Sigma_{1,3,2} + 6\Sigma_1\Sigma_{1,1}\Sigma_{1,4,1} - 24\Sigma_1\Sigma_{1,1}\Sigma_2\Sigma_4 + 6\Sigma_1\Sigma_{1,1}\Sigma_{2,1,3} \\
&+ 6\Sigma_1\Sigma_{1,1}\Sigma_{2,2,2} + 6\Sigma_1\Sigma_{1,1}\Sigma_{2,3,1} - 12\Sigma_1\Sigma_{1,1}\Sigma_3^2 + 6\Sigma_1\Sigma_{1,1}\Sigma_{3,1,2} + 6\Sigma_1\Sigma_{1,1}\Sigma_{3,2,1} + 6\Sigma_1\Sigma_{1,1}\Sigma_{4,1,1} + 6\Sigma_1\Sigma_{1,1,1}\Sigma_{1,4} \\
&+ 6\Sigma_1\Sigma_{1,1,1}\Sigma_{2,3} + 6\Sigma_1\Sigma_{1,1,1}\Sigma_{3,2} + 6\Sigma_1\Sigma_{1,1,1}\Sigma_{4,1} + 6\Sigma_1\Sigma_{1,1,1,1}\Sigma_4 - 2\Sigma_1\Sigma_{1,1,1,1,1,3} - 2\Sigma_1\Sigma_{1,1,1,1,2,2} - 2\Sigma_1\Sigma_{1,1,1,1,3,1} \\
&+ 6\Sigma_1\Sigma_{1,1,1,2}\Sigma_3 - 2\Sigma_1\Sigma_{1,1,1,2,1,2} - 2\Sigma_1\Sigma_{1,1,1,2,2,1} + 6\Sigma_1\Sigma_{1,1,1,3}\Sigma_2 - 2\Sigma_1\Sigma_{1,1,1,3,1,1} + 6\Sigma_1\Sigma_{1,1,2}\Sigma_{1,3} + 6\Sigma_1\Sigma_{1,1,2}\Sigma_{2,2} \\
&+ 6\Sigma_1\Sigma_{1,1,2}\Sigma_{3,1} + 6\Sigma_1\Sigma_{1,1,2,1}\Sigma_3 - 2\Sigma_1\Sigma_{1,1,2,1,1,2} - 2\Sigma_1\Sigma_{1,1,2,1,2,1} + 6\Sigma_1\Sigma_{1,1,2,2}\Sigma_2 - 2\Sigma_1\Sigma_{1,1,2,2,1,1} + 6\Sigma_1\Sigma_{1,1,3}\Sigma_{1,2} \\
&+ 6\Sigma_1\Sigma_{1,1,3}\Sigma_{2,1} + 6\Sigma_1\Sigma_{1,1,3,1}\Sigma_2 - 2\Sigma_1\Sigma_{1,1,3,1,1,1} + 6\Sigma_1\Sigma_{1,2}\Sigma_{1,2,2} + 6\Sigma_1\Sigma_{1,2}\Sigma_{1,3,1} - 24\Sigma_1\Sigma_{1,2}\Sigma_2\Sigma_3 \\
&+ 6\Sigma_1\Sigma_{1,2}\Sigma_{2,1,2} + 6\Sigma_1\Sigma_{1,2}\Sigma_{2,2,1} + 6\Sigma_1\Sigma_{1,2}\Sigma_{3,1,1} + 6\Sigma_1\Sigma_{1,2,1}\Sigma_{1,3} + 6\Sigma_1\Sigma_{1,2,1}\Sigma_{2,2} + 6\Sigma_1\Sigma_{1,2,1}\Sigma_{3,1} \\
&+ 6\Sigma_1\Sigma_{1,2,1,1}\Sigma_3 - 2\Sigma_1\Sigma_{1,2,1,1,1,2} - 2\Sigma_1\Sigma_{1,2,1,1,2,1} + 6\Sigma_1\Sigma_{1,2,1,2}\Sigma_2 - 2\Sigma_1\Sigma_{1,2,1,2,1,1} + 6\Sigma_1\Sigma_{1,2,2}\Sigma_{2,1} \\
&+ 6\Sigma_1\Sigma_{1,2,2,1}\Sigma_2 - 2\Sigma_1\Sigma_{1,2,2,1,1,1} - 12\Sigma_1\Sigma_{1,3}\Sigma_2^2 + 6\Sigma_1\Sigma_{1,3}\Sigma_{2,1,1} + 6\Sigma_1\Sigma_{1,3,1}\Sigma_{2,1} + 6\Sigma_1\Sigma_{1,3,1,1}\Sigma_2 \\
&- 2\Sigma_1\Sigma_{1,3,1,1,1,1} - 12\Sigma_1\Sigma_2^2\Sigma_{2,2} - 12\Sigma_1\Sigma_2^2\Sigma_{3,1} - 24\Sigma_1\Sigma_2\Sigma_{2,1}\Sigma_3 + 6\Sigma_1\Sigma_2\Sigma_{2,1,1,2} + 6\Sigma_1\Sigma_2\Sigma_{2,1,2,1} \\
&+ 6\Sigma_1\Sigma_2\Sigma_{2,2,1,1} + 6\Sigma_1\Sigma_2\Sigma_{3,1,1,1} + 6\Sigma_1\Sigma_{2,1}\Sigma_{2,1,2} + 6\Sigma_1\Sigma_{2,1}\Sigma_{2,2,1} + 6\Sigma_1\Sigma_{2,1}\Sigma_{3,1,1} + 6\Sigma_1\Sigma_{2,1,1}\Sigma_{2,2} \\
&+ 6\Sigma_1\Sigma_{2,1,1}\Sigma_{3,1} + 6\Sigma_1\Sigma_{2,1,1,1}\Sigma_3 - 2\Sigma_1\Sigma_{2,1,1,1,1,2} - 2\Sigma_1\Sigma_{2,1,1,1,2,1} - 2\Sigma_1\Sigma_{2,1,1,2,1,1} - 2\Sigma_1\Sigma_{2,1,2,1,1,1} \\
&- 2\Sigma_1\Sigma_{2,2,1,1,1,1} - 2\Sigma_1\Sigma_{3,1,1,1,1,1} + 3\Sigma_{1,1}^2\Sigma_{1,4} + 3\Sigma_{1,1}^2\Sigma_{2,3} + 3\Sigma_{1,1}^2\Sigma_{3,2} + 3\Sigma_{1,1}^2\Sigma_{4,1} + 6\Sigma_{1,1}\Sigma_{1,1,1}\Sigma_4 \\
&- 2\Sigma_{1,1}\Sigma_{1,1,1,1,3} - 2\Sigma_{1,1}\Sigma_{1,1,1,2,2} - 2\Sigma_{1,1}\Sigma_{1,1,1,3,1} + 6\Sigma_{1,1}\Sigma_{1,1,2}\Sigma_3 - 2\Sigma_{1,1}\Sigma_{1,1,2,1,2} - 2\Sigma_{1,1}\Sigma_{1,1,2,2,1} \\
&+ 6\Sigma_{1,1}\Sigma_{1,1,3}\Sigma_2 - 2\Sigma_{1,1}\Sigma_{1,1,3,1,1} + 6\Sigma_{1,1}\Sigma_{1,2}\Sigma_{1,3} + 6\Sigma_{1,1}\Sigma_{1,2}\Sigma_{2,2} + 6\Sigma_{1,1}\Sigma_{1,2}\Sigma_{3,1} + 6\Sigma_{1,1}\Sigma_{1,2,1}\Sigma_3 \\
&- 2\Sigma_{1,1}\Sigma_{1,2,1,1,2} - 2\Sigma_{1,1}\Sigma_{1,2,1,2,1} + 6\Sigma_{1,1}\Sigma_{1,2,2}\Sigma_2 - 2\Sigma_{1,1}\Sigma_{1,2,2,1,1} + 6\Sigma_{1,1}\Sigma_{1,3}\Sigma_{2,1} + 6\Sigma_{1,1}\Sigma_{1,3,1}\Sigma_2 \\
&- 2\Sigma_{1,1}\Sigma_{1,3,1,1,1} - 12\Sigma_{1,1}\Sigma_2^2\Sigma_3 + 6\Sigma_{1,1}\Sigma_2\Sigma_{2,1,2} + 6\Sigma_{1,1}\Sigma_2\Sigma_{2,2,1} + 6\Sigma_{1,1}\Sigma_2\Sigma_{3,1,1} + 6\Sigma_{1,1}\Sigma_{2,1}\Sigma_{2,2} \\
&+ 6\Sigma_{1,1}\Sigma_{2,1}\Sigma_{3,1} + 6\Sigma_{1,1}\Sigma_{2,1,1}\Sigma_3 - 2\Sigma_{1,1}\Sigma_{2,1,1,1,2} - 2\Sigma_{1,1}\Sigma_{2,1,1,2,1} - 2\Sigma_{1,1}\Sigma_{2,1,2,1,1} - 2\Sigma_{1,1}\Sigma_{2,2,1,1,1} \\
&- 2\Sigma_{1,1}\Sigma_{3,1,1,1,1} - 2\Sigma_{1,1,1}\Sigma_{1,1,1,3} - 2\Sigma_{1,1,1}\Sigma_{1,1,2,2} - 2\Sigma_{1,1,1}\Sigma_{1,1,3,1} + 6\Sigma_{1,1,1}\Sigma_{1,2}\Sigma_3 - 2\Sigma_{1,1,1}\Sigma_{1,2,1,2} \\
&- 2\Sigma_{1,1,1}\Sigma_{1,2,2,1} + 6\Sigma_{1,1,1}\Sigma_{1,3}\Sigma_2 - 2\Sigma_{1,1,1}\Sigma_{1,3,1,1} + 6\Sigma_{1,1,1}\Sigma_2\Sigma_{2,2} + 6\Sigma_{1,1,1}\Sigma_2\Sigma_{3,1} + 6\Sigma_{1,1,1}\Sigma_{2,1}\Sigma_3 \\
&- 2\Sigma_{1,1,1}\Sigma_{2,1,1,2} - 2\Sigma_{1,1,1}\Sigma_{2,1,2,1} - 2\Sigma_{1,1,1}\Sigma_{2,2,1,1} - 2\Sigma_{1,1,1}\Sigma_{3,1,1,1} - 2\Sigma_{1,1,1,1}\Sigma_{1,1,3} - 2\Sigma_{1,1,1,1}\Sigma_{1,2,2} \\
&- 2\Sigma_{1,1,1,1}\Sigma_{1,3,1} + 6\Sigma_{1,1,1,1}\Sigma_2\Sigma_3 - 2\Sigma_{1,1,1,1}\Sigma_{2,1,2} - 2\Sigma_{1,1,1,1}\Sigma_{2,2,1} - 2\Sigma_{1,1,1,1}\Sigma_{3,1,1} - 2\Sigma_{1,1,1,1,1}\Sigma_{1,3} \\
&- 2\Sigma_{1,1,1,1,1}\Sigma_{2,2} - 2\Sigma_{1,1,1,1,1}\Sigma_{3,1} - 2\Sigma_{1,1,1,1,1,1}\Sigma_3 + \Sigma_{1,1,1,1,1,1,1,2} + \Sigma_{1,1,1,1,1,1,2,1} - 2\Sigma_{1,1,1,1,1,2}\Sigma_2
\end{aligned}
$$

$$
\begin{aligned}
&+ \Sigma_{1,1,1,1,1,2,1,1} - 2\Sigma_{1,1,1,1,2}\Sigma_{1,2} - 2\Sigma_{1,1,1,1,2}\Sigma_{2,1} - 2\Sigma_{1,1,1,1,2,1}\Sigma_2 + \Sigma_{1,1,1,1,2,1,1,1} - 2\Sigma_{1,1,1,2}\Sigma_{1,1,2} \\
&- 2\Sigma_{1,1,1,2}\Sigma_{1,2,1} + 3\Sigma_{1,1,1,2}\Sigma_2^2 - 2\Sigma_{1,1,1,2}\Sigma_{2,1,1} - 2\Sigma_{1,1,1,2,1}\Sigma_{1,2} - 2\Sigma_{1,1,1,2,1}\Sigma_{2,1} - 2\Sigma_{1,1,1,2,1,1}\Sigma_2 \\
&+ \Sigma_{1,1,1,2,1,1,1,1} - 2\Sigma_{1,1,2}\Sigma_{1,1,2,1} + 6\Sigma_{1,1,2}\Sigma_{1,2}\Sigma_2 - 2\Sigma_{1,1,2}\Sigma_{1,2,1,1} + 6\Sigma_{1,1,2}\Sigma_2\Sigma_{2,1} - 2\Sigma_{1,1,2}\Sigma_{2,1,1,1} \\
&- 2\Sigma_{1,1,2,1}\Sigma_{1,2,1} + 3\Sigma_{1,1,2,1}\Sigma_2^2 - 2\Sigma_{1,1,2,1}\Sigma_{2,1,1} - 2\Sigma_{1,1,2,1,1}\Sigma_{1,2} - 2\Sigma_{1,1,2,1,1}\Sigma_{2,1} - 2\Sigma_{1,1,2,1,1,1}\Sigma_2 \\
&+ \Sigma_{1,1,2,1,1,1,1,1} + \Sigma_{1,2}^3 + 3\Sigma_{1,2}^2\Sigma_{2,1} + 6\Sigma_{1,2}\Sigma_{1,2,1}\Sigma_2 - 2\Sigma_{1,2}\Sigma_{1,2,1,1,1} - 4\Sigma_{1,2}\Sigma_2^3 + 6\Sigma_{1,2}\Sigma_2\Sigma_{2,1,1} \\
&+ 3\Sigma_{1,2}\Sigma_{2,1}^2 - 2\Sigma_{1,2}\Sigma_{2,1,1,1,1} - 2\Sigma_{1,2,1}\Sigma_{1,2,1,1} + 6\Sigma_{1,2,1}\Sigma_2\Sigma_{2,1} - 2\Sigma_{1,2,1}\Sigma_{2,1,1,1} + 3\Sigma_{1,2,1,1}\Sigma_2^2 \\
&- 2\Sigma_{1,2,1,1}\Sigma_{2,1,1} - 2\Sigma_{1,2,1,1,1}\Sigma_{2,1} - 2\Sigma_{1,2,1,1,1,1}\Sigma_2 + \Sigma_{1,2,1,1,1,1,1,1} - 4\Sigma_2^3\Sigma_{2,1} + 3\Sigma_2^2\Sigma_{2,1,1,1} \\
&+ 6\Sigma_2\Sigma_{2,1}\Sigma_{2,1,1} - 2\Sigma_2\Sigma_{2,1,1,1,1,1} + \Sigma_{2,1}^3 - 2\Sigma_{2,1}\Sigma_{2,1,1,1,1} - 2\Sigma_{2,1,1}\Sigma_{2,1,1,1} + \Sigma_{2,1,1,1,1,1,1,1}\big) \\
&- V_{00}^2\big(10\Sigma_1^3\Sigma_6 - 6\Sigma_1^2\Sigma_{1,1,5} - 6\Sigma_1^2\Sigma_{1,2,4} - 6\Sigma_1^2\Sigma_{1,3,3} - 6\Sigma_1^2\Sigma_{1,4,2} - 6\Sigma_1^2\Sigma_{1,5,1} + 30\Sigma_1^2\Sigma_2\Sigma_5 - 6\Sigma_1^2\Sigma_{2,1,4} - 6\Sigma_1^2\Sigma_{2,2,3} \\
&- 6\Sigma_1^2\Sigma_{2,3,2} - 6\Sigma_1^2\Sigma_{2,4,1} + 30\Sigma_1^2\Sigma_3\Sigma_4 - 6\Sigma_1^2\Sigma_{3,1,3} - 6\Sigma_1^2\Sigma_{3,2,2} - 6\Sigma_1^2\Sigma_{3,3,1} - 6\Sigma_1^2\Sigma_{4,1,2} - 6\Sigma_1^2\Sigma_{4,2,1} - 6\Sigma_1^2\Sigma_{5,1,1} - 12\Sigma_1\Sigma_{1,1}\Sigma_{1,5} \\
&- 12\Sigma_1\Sigma_{1,1}\Sigma_{2,4} - 12\Sigma_1\Sigma_{1,1}\Sigma_{3,3} - 12\Sigma_1\Sigma_{1,1}\Sigma_{4,2} - 12\Sigma_1\Sigma_{1,1}\Sigma_{5,1} - 12\Sigma_1\Sigma_{1,1,1}\Sigma_5 + 3\Sigma_1\Sigma_{1,1,1,1,4} + 3\Sigma_1\Sigma_{1,1,1,2,3} \\
&+ 3\Sigma_1\Sigma_{1,1,1,3,2} + 3\Sigma_1\Sigma_{1,1,1,4,1} - 12\Sigma_1\Sigma_{1,1,2}\Sigma_4 + 3\Sigma_1\Sigma_{1,1,2,1,3} + 3\Sigma_1\Sigma_{1,1,2,2,2} + 3\Sigma_1\Sigma_{1,1,2,3,1} - 12\Sigma_1\Sigma_{1,1,3}\Sigma_3 + 3\Sigma_1\Sigma_{1,1,3,1,2} \\
&+ 3\Sigma_1\Sigma_{1,1,3,2,1} - 12\Sigma_1\Sigma_{1,1,4}\Sigma_2 + 3\Sigma_1\Sigma_{1,1,4,1,1} - 12\Sigma_1\Sigma_{1,2}\Sigma_{1,4} - 12\Sigma_1\Sigma_{1,2}\Sigma_{2,3} - 12\Sigma_1\Sigma_{1,2}\Sigma_{3,2} - 12\Sigma_1\Sigma_{1,2}\Sigma_{4,1} \\
&- 12\Sigma_1\Sigma_{1,2,1}\Sigma_4 + 3\Sigma_1\Sigma_{1,2,1,1,3} + 3\Sigma_1\Sigma_{1,2,1,2,2} + 3\Sigma_1\Sigma_{1,2,1,3,1} - 12\Sigma_1\Sigma_{1,2,2}\Sigma_3 + 3\Sigma_1\Sigma_{1,2,2,1,2} + 3\Sigma_1\Sigma_{1,2,2,2,1} \\
&- 12\Sigma_1\Sigma_{1,2,3}\Sigma_2 + 3\Sigma_1\Sigma_{1,2,3,1,1} - 6\Sigma_1\Sigma_{1,3}^2 - 12\Sigma_1\Sigma_{1,3}\Sigma_{2,2} - 12\Sigma_1\Sigma_{1,3}\Sigma_{3,1} - 12\Sigma_1\Sigma_{1,3,1}\Sigma_3 + 3\Sigma_1\Sigma_{1,3,1,1,2} \\
&+ 3\Sigma_1\Sigma_{1,3,1,2,1} - 12\Sigma_1\Sigma_{1,3,2}\Sigma_2 + 3\Sigma_1\Sigma_{1,3,2,1,1} - 12\Sigma_1\Sigma_{1,4}\Sigma_{2,1} - 12\Sigma_1\Sigma_{1,4,1}\Sigma_2 + 3\Sigma_1\Sigma_{1,4,1,1,1} + 30\Sigma_1\Sigma_2^2\Sigma_4 \\
&- 12\Sigma_1\Sigma_2\Sigma_{2,1,3} - 12\Sigma_1\Sigma_2\Sigma_{2,2,2} - 12\Sigma_1\Sigma_2\Sigma_{2,3,1} + 30\Sigma_1\Sigma_2\Sigma_3^2 - 12\Sigma_1\Sigma_2\Sigma_{3,1,2} - 12\Sigma_1\Sigma_2\Sigma_{3,2,1} - 12\Sigma_1\Sigma_2\Sigma_{4,1,1} \\
&- 12\Sigma_1\Sigma_{2,1}\Sigma_{2,3} - 12\Sigma_1\Sigma_{2,1}\Sigma_{3,2} - 12\Sigma_1\Sigma_{2,1}\Sigma_{4,1} - 12\Sigma_1\Sigma_{2,1,1}\Sigma_4 + 3\Sigma_1\Sigma_{2,1,1,1,3} + 3\Sigma_1\Sigma_{2,1,1,2,2} + 3\Sigma_1\Sigma_{2,1,1,3,1} \\
&- 12\Sigma_1\Sigma_{2,1,2}\Sigma_3 + 3\Sigma_1\Sigma_{2,1,2,1,2} + 3\Sigma_1\Sigma_{2,1,2,2,1} + 3\Sigma_1\Sigma_{2,1,3,1,1} - 6\Sigma_1\Sigma_{2,2}^2 - 12\Sigma_1\Sigma_{2,2}\Sigma_{3,1} - 12\Sigma_1\Sigma_{2,2,1}\Sigma_3 \\
&+ 3\Sigma_1\Sigma_{2,2,1,1,2} + 3\Sigma_1\Sigma_{2,2,1,2,1} + 3\Sigma_1\Sigma_{2,2,2,1,1} + 3\Sigma_1\Sigma_{2,3,1,1,1} - 12\Sigma_1\Sigma_3\Sigma_{3,1,1} - 6\Sigma_1\Sigma_{3,1}^2 + 3\Sigma_1\Sigma_{3,1,1,1,2} \\
&+ 3\Sigma_1\Sigma_{3,1,1,2,1} + 3\Sigma_1\Sigma_{3,1,2,1,1} + 3\Sigma_1\Sigma_{3,2,1,1,1} + 3\Sigma_1\Sigma_{4,1,1,1,1} - 6\Sigma_{1,1}^2\Sigma_5 + 3\Sigma_{1,1}\Sigma_{1,1,1,4} + 3\Sigma_{1,1}\Sigma_{1,1,2,3} \\
&+ 3\Sigma_{1,1}\Sigma_{1,1,3,2} + 3\Sigma_{1,1}\Sigma_{1,1,4,1} - 12\Sigma_{1,1}\Sigma_{1,2}\Sigma_4 + 3\Sigma_{1,1}\Sigma_{1,2,1,3} + 3\Sigma_{1,1}\Sigma_{1,2,2,2} + 3\Sigma_{1,1}\Sigma_{1,2,3,1} - 12\Sigma_{1,1}\Sigma_{1,3}\Sigma_3 \\
&+ 3\Sigma_{1,1}\Sigma_{1,3,1,2} + 3\Sigma_{1,1}\Sigma_{1,3,2,1} - 12\Sigma_{1,1}\Sigma_{1,4}\Sigma_2 + 3\Sigma_{1,1}\Sigma_{1,4,1,1} - 12\Sigma_{1,1}\Sigma_2\Sigma_{2,3} - 12\Sigma_{1,1}\Sigma_2\Sigma_{3,2} \\
&- 12\Sigma_{1,1}\Sigma_2\Sigma_{4,1} - 12\Sigma_{1,1}\Sigma_{2,1}\Sigma_4 + 3\Sigma_{1,1}\Sigma_{2,1,1,3} + 3\Sigma_{1,1}\Sigma_{2,1,2,2} + 3\Sigma_{1,1}\Sigma_{2,1,3,1} - 12\Sigma_{1,1}\Sigma_{2,2}\Sigma_3 \\
&+ 3\Sigma_{1,1}\Sigma_{2,2,1,2} + 3\Sigma_{1,1}\Sigma_{2,2,2,1} + 3\Sigma_{1,1}\Sigma_{2,3,1,1} - 12\Sigma_{1,1}\Sigma_3\Sigma_{3,1} + 3\Sigma_{1,1}\Sigma_{3,1,1,2} + 3\Sigma_{1,1}\Sigma_{3,1,2,1} \\
&+ 3\Sigma_{1,1}\Sigma_{3,2,1,1} + 3\Sigma_{1,1}\Sigma_{4,1,1,1} + 3\Sigma_{1,1,1}\Sigma_{1,1,4} + 3\Sigma_{1,1,1}\Sigma_{1,2,3} + 3\Sigma_{1,1,1}\Sigma_{1,3,2} + 3\Sigma_{1,1,1}\Sigma_{1,4,1} - 12\Sigma_{1,1,1}\Sigma_2\Sigma_4
\end{aligned}
$$

$$+ 3\Sigma_{1,1,1}\Sigma_{2,1,3} + 3\Sigma_{1,1,1}\Sigma_{2,2,2} + 3\Sigma_{1,1,1}\Sigma_{2,3,1} - 6\Sigma_{1,1,1}\Sigma_3^2 + 3\Sigma_{1,1,1}\Sigma_{3,1,2} + 3\Sigma_{1,1,1}\Sigma_{3,2,1} + 3\Sigma_{1,1,1}\Sigma_{4,1,1}$$

$$+ 3\Sigma_{1,1,1,1}\Sigma_{1,4} + 3\Sigma_{1,1,1,1}\Sigma_{2,3} + 3\Sigma_{1,1,1,1}\Sigma_{3,2} + 3\Sigma_{1,1,1,1}\Sigma_{4,1} + 3\Sigma_{1,1,1,1,1}\Sigma_4 - \Sigma_{1,1,1,1,1,1,3} - \Sigma_{1,1,1,1,1,2,2}$$

$$- \Sigma_{1,1,1,1,1,3,1} + 3\Sigma_{1,1,1,1,2}\Sigma_3 - \Sigma_{1,1,1,1,2,1,2} - \Sigma_{1,1,1,1,2,2,1} + 3\Sigma_{1,1,1,1,3}\Sigma_2 - \Sigma_{1,1,1,1,3,1,1} + 3\Sigma_{1,1,1,2}\Sigma_{1,3}$$

$$+ 3\Sigma_{1,1,1,2}\Sigma_{2,2} + 3\Sigma_{1,1,1,2}\Sigma_{3,1} + 3\Sigma_{1,1,1,2,1}\Sigma_3 - \Sigma_{1,1,1,2,1,1,2} - \Sigma_{1,1,1,2,1,2,1} + 3\Sigma_{1,1,1,2,2}\Sigma_2 - \Sigma_{1,1,1,2,2,1,1}$$

$$+ 3\Sigma_{1,1,1,3}\Sigma_{1,2} + 3\Sigma_{1,1,1,3}\Sigma_{2,1} + 3\Sigma_{1,1,1,3,1}\Sigma_2 - \Sigma_{1,1,1,3,1,1,1} + 3\Sigma_{1,1,2}\Sigma_{1,1,3} + 3\Sigma_{1,1,2}\Sigma_{1,2,2} + 3\Sigma_{1,1,2}\Sigma_{1,3,1}$$

$$- 12\Sigma_{1,1,2}\Sigma_2\Sigma_3 + 3\Sigma_{1,1,2}\Sigma_{2,1,2} + 3\Sigma_{1,1,2}\Sigma_{2,2,1} + 3\Sigma_{1,1,2}\Sigma_{3,1,1} + 3\Sigma_{1,1,2,1}\Sigma_{1,3} + 3\Sigma_{1,1,2,1}\Sigma_{2,2}$$

$$+ 3\Sigma_{1,1,2,1}\Sigma_{3,1} + 3\Sigma_{1,1,2,1,1}\Sigma_3 - \Sigma_{1,1,2,1,1,1,2} - \Sigma_{1,1,2,1,1,2,1} + 3\Sigma_{1,1,2,1,2}\Sigma_2 - \Sigma_{1,1,2,1,2,1,1} + 3\Sigma_{1,1,2,2}\Sigma_{1,2}$$

$$+ 3\Sigma_{1,1,2,2}\Sigma_{2,1} + 3\Sigma_{1,1,2,2,1}\Sigma_2 - \Sigma_{1,1,2,2,1,1,1} + 3\Sigma_{1,1,3}\Sigma_{1,2,1} - 6\Sigma_{1,1,3}\Sigma_2^2 + 3\Sigma_{1,1,3}\Sigma_{2,1,1} + 3\Sigma_{1,1,3,1}\Sigma_{1,2}$$

$$+ 3\Sigma_{1,1,3,1}\Sigma_{2,1} + 3\Sigma_{1,1,3,1,1}\Sigma_2 - \Sigma_{1,1,3,1,1,1,1} - 6\Sigma_{1,2}^2\Sigma_3 + 3\Sigma_{1,2}\Sigma_{1,2,1,2} + 3\Sigma_{1,2}\Sigma_{1,2,2,1} - 12\Sigma_{1,2}\Sigma_{1,3}\Sigma_2$$

$$+ 3\Sigma_{1,2}\Sigma_{1,3,1,1} - 12\Sigma_{1,2}\Sigma_2\Sigma_{2,2} - 12\Sigma_{1,2}\Sigma_2\Sigma_{3,1} - 12\Sigma_{1,2}\Sigma_{2,1}\Sigma_3 + 3\Sigma_{1,2}\Sigma_{2,1,1,2} + 3\Sigma_{1,2}\Sigma_{2,1,2,1}$$

$$+ 3\Sigma_{1,2}\Sigma_{2,2,1,1} + 3\Sigma_{1,2}\Sigma_{3,1,1,1} + 3\Sigma_{1,2,1}\Sigma_{1,2,2} + 3\Sigma_{1,2,1}\Sigma_{1,3,1} - 12\Sigma_{1,2,1}\Sigma_2\Sigma_3 + 3\Sigma_{1,2,1}\Sigma_{2,1,2}$$

$$+ 3\Sigma_{1,2,1}\Sigma_{2,2,1} + 3\Sigma_{1,2,1}\Sigma_{3,1,1} + 3\Sigma_{1,2,1,1}\Sigma_{1,3} + 3\Sigma_{1,2,1,1}\Sigma_{2,2} + 3\Sigma_{1,2,1,1}\Sigma_{3,1} + 3\Sigma_{1,2,1,1,1}\Sigma_3$$

$$- \Sigma_{1,2,1,1,1,1,2} - \Sigma_{1,2,1,1,1,2,1} + 3\Sigma_{1,2,1,1,2}\Sigma_2 - \Sigma_{1,2,1,1,2,1,1} + 3\Sigma_{1,2,1,2}\Sigma_{2,1} + 3\Sigma_{1,2,1,2,1}\Sigma_2 - \Sigma_{1,2,1,2,1,1,1}$$

$$- 6\Sigma_{1,2,2}\Sigma_2^2 + 3\Sigma_{1,2,2}\Sigma_{2,1,1} + 3\Sigma_{1,2,2,1}\Sigma_{2,1} + 3\Sigma_{1,2,2,1,1}\Sigma_2 - \Sigma_{1,2,2,1,1,1,1} - 12\Sigma_{1,3}\Sigma_2\Sigma_{2,1}$$

$$+ 3\Sigma_{1,3}\Sigma_{2,1,1,1} - 6\Sigma_{1,3,1}\Sigma_2^2 + 3\Sigma_{1,3,1}\Sigma_{2,1,1} + 3\Sigma_{1,3,1,1}\Sigma_{2,1} + 3\Sigma_{1,3,1,1,1}\Sigma_2 - \Sigma_{1,3,1,1,1,1,1}$$

$$+ 10\Sigma_2^3\Sigma_3 - 6\Sigma_2^2\Sigma_{2,1,2} - 6\Sigma_2^2\Sigma_{2,2,1} - 6\Sigma_2^2\Sigma_{3,1,1} - 12\Sigma_2\Sigma_{2,1}\Sigma_{2,2} - 12\Sigma_2\Sigma_{2,1}\Sigma_{3,1} - 12\Sigma_2\Sigma_{2,1,1}\Sigma_3$$

$$+ 3\Sigma_2\Sigma_{2,1,1,1,2} + 3\Sigma_2\Sigma_{2,1,1,2,1} + 3\Sigma_2\Sigma_{2,1,2,1,1} + 3\Sigma_2\Sigma_{2,2,1,1,1} + 3\Sigma_2\Sigma_{3,1,1,1,1} - 6\Sigma_{2,1}^2\Sigma_3$$

$$+ 3\Sigma_{2,1}\Sigma_{2,1,1,2} + 3\Sigma_{2,1}\Sigma_{2,1,2,1} + 3\Sigma_{2,1}\Sigma_{2,2,1,1} + 3\Sigma_{2,1}\Sigma_{3,1,1,1} + 3\Sigma_{2,1,1}\Sigma_{2,1,2} + 3\Sigma_{2,1,1}\Sigma_{2,2,1}$$

$$+ 3\Sigma_{2,1,1}\Sigma_{3,1,1} + 3\Sigma_{2,1,1,1}\Sigma_{2,2} + 3\Sigma_{2,1,1,1}\Sigma_{3,1} + 3\Sigma_{2,1,1,1,1}\Sigma_3 - \Sigma_{2,1,1,1,1,1,2} - \Sigma_{2,1,1,1,1,2,1}$$

$$- \Sigma_{2,1,1,1,2,1,1} - \Sigma_{2,1,1,2,1,1,1} - \Sigma_{2,1,2,1,1,1,1} - \Sigma_{2,2,1,1,1,1,1} - \Sigma_{3,1,1,1,1,1,1})$$

$$+ V_{00}^3(-10\Sigma_1^2\Sigma_{1,6} - 10\Sigma_1^2\Sigma_{2,5} - 10\Sigma_1^2\Sigma_{3,4} - 10\Sigma_1^2\Sigma_{4,3} - 10\Sigma_1^2\Sigma_{5,2} - 10\Sigma_1^2\Sigma_{6,1} - 20\Sigma_1\Sigma_{1,1}\Sigma_6 + 4\Sigma_1\Sigma_{1,1,1,5} + 4\Sigma_1\Sigma_{1,1,2,4}$$

$$+ 4\Sigma_1\Sigma_{1,1,3,3} + 4\Sigma_1\Sigma_{1,1,4,2} + 4\Sigma_1\Sigma_{1,1,5,1} - 20\Sigma_1\Sigma_{1,2}\Sigma_5 + 4\Sigma_1\Sigma_{1,2,1,4} + 4\Sigma_1\Sigma_{1,2,2,3} + 4\Sigma_1\Sigma_{1,2,3,2} + 4\Sigma_1\Sigma_{1,2,4,1} - 20\Sigma_1\Sigma_{1,3}\Sigma_4$$

$$+ 4\Sigma_1\Sigma_{1,3,1,3} + 4\Sigma_1\Sigma_{1,3,2,2} + 4\Sigma_1\Sigma_{1,3,3,1} - 20\Sigma_1\Sigma_{1,4}\Sigma_3 + 4\Sigma_1\Sigma_{1,4,1,2} + 4\Sigma_1\Sigma_{1,4,2,1} - 20\Sigma_1\Sigma_{1,5}\Sigma_2 + 4\Sigma_1\Sigma_{1,5,1,1} - 20\Sigma_1\Sigma_2\Sigma_{2,4}$$

$$- 20\Sigma_1\Sigma_2\Sigma_{3,3} - 20\Sigma_1\Sigma_2\Sigma_{4,2} - 20\Sigma_1\Sigma_2\Sigma_{5,1} - 20\Sigma_1\Sigma_{2,1}\Sigma_5 + 4\Sigma_1\Sigma_{2,1,1,4} + 4\Sigma_1\Sigma_{2,1,2,3} + 4\Sigma_1\Sigma_{2,1,3,2} + 4\Sigma_1\Sigma_{2,1,4,1}$$

$$- 20\Sigma_1\Sigma_{2,2}\Sigma_4 + 4\Sigma_1\Sigma_{2,2,1,3} + 4\Sigma_1\Sigma_{2,2,2,2} + 4\Sigma_1\Sigma_{2,2,3,1} - 20\Sigma_1\Sigma_{2,3}\Sigma_3 + 4\Sigma_1\Sigma_{2,3,1,2} + 4\Sigma_1\Sigma_{2,3,2,1} + 4\Sigma_1\Sigma_{2,4,1,1}$$

$$- 20\Sigma_1\Sigma_3\Sigma_{3,2} - 20\Sigma_1\Sigma_3\Sigma_{4,1} - 20\Sigma_1\Sigma_{3,1}\Sigma_4 + 4\Sigma_1\Sigma_{3,1,1,3} + 4\Sigma_1\Sigma_{3,1,2,2} + 4\Sigma_1\Sigma_{3,1,3,1} + 4\Sigma_1\Sigma_{3,2,1,2} + 4\Sigma_1\Sigma_{3,2,2,1}$$

$$+ 4\Sigma_1\Sigma_{3,3,1,1} + 4\Sigma_1\Sigma_{4,1,1,2} + 4\Sigma_1\Sigma_{4,1,2,1} + 4\Sigma_1\Sigma_{4,2,1,1} + 4\Sigma_1\Sigma_{5,1,1,1} + 4\Sigma_{1,1}\Sigma_{1,1,5} + 4\Sigma_{1,1}\Sigma_{1,2,4} + 4\Sigma_{1,1}\Sigma_{1,3,3}$$

$$+ 4\Sigma_{1,1}\Sigma_{1,4,2} + 4\Sigma_{1,1}\Sigma_{1,5,1} - 20\Sigma_{1,1}\Sigma_2\Sigma_5 + 4\Sigma_{1,1}\Sigma_{2,1,4} + 4\Sigma_{1,1}\Sigma_{2,2,3} + 4\Sigma_{1,1}\Sigma_{2,3,2} + 4\Sigma_{1,1}\Sigma_{2,4,1} - 20\Sigma_{1,1}\Sigma_3\Sigma_4$$
$$+ 4\Sigma_{1,1}\Sigma_{3,1,3} + 4\Sigma_{1,1}\Sigma_{3,2,2} + 4\Sigma_{1,1}\Sigma_{3,3,1} + 4\Sigma_{1,1}\Sigma_{4,1,2} + 4\Sigma_{1,1}\Sigma_{4,2,1} + 4\Sigma_{1,1}\Sigma_{5,1,1} + 4\Sigma_{1,1,1}\Sigma_{1,5} + 4\Sigma_{1,1,1}\Sigma_{2,4}$$
$$+ 4\Sigma_{1,1,1}\Sigma_{3,3} + 4\Sigma_{1,1,1}\Sigma_{4,2} + 4\Sigma_{1,1,1}\Sigma_{5,1} + 4\Sigma_{1,1,1,1}\Sigma_5 - \Sigma_{1,1,1,1,1,4} - \Sigma_{1,1,1,1,2,3} - \Sigma_{1,1,1,1,3,2} - \Sigma_{1,1,1,1,4,1} + 4\Sigma_{1,1,1,2}\Sigma_4$$
$$- \Sigma_{1,1,1,2,1,3} - \Sigma_{1,1,1,2,2,2} - \Sigma_{1,1,1,2,3,1} + 4\Sigma_{1,1,1,3}\Sigma_3 - \Sigma_{1,1,1,3,1,2} - \Sigma_{1,1,1,3,2,1} + 4\Sigma_{1,1,1,4}\Sigma_2 - \Sigma_{1,1,1,4,1,1} + 4\Sigma_{1,1,2}\Sigma_{1,4}$$
$$+ 4\Sigma_{1,1,2}\Sigma_{2,3} + 4\Sigma_{1,1,2}\Sigma_{3,2} + 4\Sigma_{1,1,2}\Sigma_{4,1} + 4\Sigma_{1,1,2,1}\Sigma_4 - \Sigma_{1,1,2,1,1,3} - \Sigma_{1,1,2,1,2,2} - \Sigma_{1,1,2,1,3,1} + 4\Sigma_{1,1,2,2}\Sigma_3$$
$$- \Sigma_{1,1,2,2,1,2} - \Sigma_{1,1,2,2,2,1} + 4\Sigma_{1,1,2,3}\Sigma_2 - \Sigma_{1,1,2,3,1,1} + 4\Sigma_{1,1,3}\Sigma_{1,3} + 4\Sigma_{1,1,3}\Sigma_{2,2} + 4\Sigma_{1,1,3}\Sigma_{3,1} + 4\Sigma_{1,1,3,1}\Sigma_3$$
$$- \Sigma_{1,1,3,1,1,2} - \Sigma_{1,1,3,1,2,1} + 4\Sigma_{1,1,3,2}\Sigma_2 - \Sigma_{1,1,3,2,1,1} + 4\Sigma_{1,1,4}\Sigma_{1,2} + 4\Sigma_{1,1,4}\Sigma_{2,1} + 4\Sigma_{1,1,4,1}\Sigma_2 - \Sigma_{1,1,4,1,1,1}$$
$$+ 4\Sigma_{1,2}\Sigma_{1,2,3} + 4\Sigma_{1,2}\Sigma_{1,3,2} + 4\Sigma_{1,2}\Sigma_{1,4,1} - 20\Sigma_{1,2}\Sigma_2\Sigma_4 + 4\Sigma_{1,2}\Sigma_{2,1,3} + 4\Sigma_{1,2}\Sigma_{2,2,2} + 4\Sigma_{1,2}\Sigma_{2,3,1} - 10\Sigma_{1,2}\Sigma_3^2$$
$$+ 4\Sigma_{1,2}\Sigma_{3,1,2} + 4\Sigma_{1,2}\Sigma_{3,2,1} + 4\Sigma_{1,2}\Sigma_{4,1,1} + 4\Sigma_{1,2,1}\Sigma_{1,4} + 4\Sigma_{1,2,1}\Sigma_{2,3} + 4\Sigma_{1,2,1}\Sigma_{3,2} + 4\Sigma_{1,2,1}\Sigma_{4,1} + 4\Sigma_{1,2,1,1}\Sigma_4$$
$$- \Sigma_{1,2,1,1,1,3} - \Sigma_{1,2,1,1,2,2} - \Sigma_{1,2,1,1,3,1} + 4\Sigma_{1,2,1,2}\Sigma_3 - \Sigma_{1,2,1,2,1,2} - \Sigma_{1,2,1,2,2,1} + 4\Sigma_{1,2,1,3}\Sigma_2 - \Sigma_{1,2,1,3,1,1} + 4\Sigma_{1,2,2}\Sigma_{1,3}$$
$$+ 4\Sigma_{1,2,2}\Sigma_{2,2} + 4\Sigma_{1,2,2}\Sigma_{3,1} + 4\Sigma_{1,2,2,1}\Sigma_3 - \Sigma_{1,2,2,1,1,2} - \Sigma_{1,2,2,1,2,1} + 4\Sigma_{1,2,2,2}\Sigma_2 - \Sigma_{1,2,2,2,1,1} + 4\Sigma_{1,2,3}\Sigma_{2,1}$$
$$+ 4\Sigma_{1,2,3,1}\Sigma_2 - \Sigma_{1,2,3,1,1,1} + 4\Sigma_{1,3}\Sigma_{1,3,1} - 20\Sigma_{1,3}\Sigma_2\Sigma_3 + 4\Sigma_{1,3}\Sigma_{2,1,2} + 4\Sigma_{1,3}\Sigma_{2,2,1} + 4\Sigma_{1,3}\Sigma_{3,1,1} + 4\Sigma_{1,3,1}\Sigma_{2,2}$$
$$+ 4\Sigma_{1,3,1}\Sigma_{3,1} + 4\Sigma_{1,3,1,1}\Sigma_3 - \Sigma_{1,3,1,1,1,2} - \Sigma_{1,3,1,1,2,1} + 4\Sigma_{1,3,1,2}\Sigma_2 - \Sigma_{1,3,1,2,1,1} + 4\Sigma_{1,3,2}\Sigma_{2,1} + 4\Sigma_{1,3,2,1}\Sigma_2$$
$$- \Sigma_{1,3,2,1,1,1} - 10\Sigma_{1,4}\Sigma_2^2 + 4\Sigma_{1,4}\Sigma_{2,1,1} + 4\Sigma_{1,4,1}\Sigma_{2,1} + 4\Sigma_{1,4,1,1}\Sigma_2 - \Sigma_{1,4,1,1,1,1} - 10\Sigma_2^2\Sigma_{2,3} - 10\Sigma_2^2\Sigma_{3,2}$$
$$- 10\Sigma_2^2\Sigma_{4,1} - 20\Sigma_2\Sigma_{2,1}\Sigma_4 + 4\Sigma_2\Sigma_{2,1,1,3} + 4\Sigma_2\Sigma_{2,1,2,2} + 4\Sigma_2\Sigma_{2,1,3,1} - 20\Sigma_2\Sigma_{2,2}\Sigma_3 + 4\Sigma_2\Sigma_{2,2,1,2}$$
$$+ 4\Sigma_2\Sigma_{2,2,2,1} + 4\Sigma_2\Sigma_{2,3,1,1} - 20\Sigma_2\Sigma_3\Sigma_{3,1} + 4\Sigma_2\Sigma_{3,1,1,2} + 4\Sigma_2\Sigma_{3,1,2,1} + 4\Sigma_2\Sigma_{3,2,1,1} + 4\Sigma_2\Sigma_{4,1,1,1}$$
$$+ 4\Sigma_{2,1}\Sigma_{2,1,3} + 4\Sigma_{2,1}\Sigma_{2,2,2} + 4\Sigma_{2,1}\Sigma_{2,3,1} - 10\Sigma_{2,1}\Sigma_3^2 + 4\Sigma_{2,1}\Sigma_{3,1,2} + 4\Sigma_{2,1}\Sigma_{3,2,1} + 4\Sigma_{2,1}\Sigma_{4,1,1}$$
$$+ 4\Sigma_{2,1,1}\Sigma_{2,3} + 4\Sigma_{2,1,1}\Sigma_{3,2} + 4\Sigma_{2,1,1}\Sigma_{4,1} + 4\Sigma_{2,1,1,1}\Sigma_4 - \Sigma_{2,1,1,1,1,3} - \Sigma_{2,1,1,1,2,2} - \Sigma_{2,1,1,1,3,1} + 4\Sigma_{2,1,1,2}\Sigma_3$$
$$- \Sigma_{2,1,1,2,1,2} - \Sigma_{2,1,1,2,2,1} - \Sigma_{2,1,1,3,1,1} + 4\Sigma_{2,1,2}\Sigma_{2,2} + 4\Sigma_{2,1,2}\Sigma_{3,1} + 4\Sigma_{2,1,2,1}\Sigma_3 - \Sigma_{2,1,2,1,1,2} - \Sigma_{2,1,2,1,2,1}$$
$$- \Sigma_{2,1,2,2,1,1} - \Sigma_{2,1,3,1,1,1} + 4\Sigma_{2,2}\Sigma_{2,2,1} + 4\Sigma_{2,2}\Sigma_{3,1,1} + 4\Sigma_{2,2,1}\Sigma_{3,1} + 4\Sigma_{2,2,1,1}\Sigma_3 - \Sigma_{2,2,1,1,1,2} - \Sigma_{2,2,1,1,2,1}$$
$$- \Sigma_{2,2,1,2,1,1} - \Sigma_{2,2,2,1,1,1} - \Sigma_{2,3,1,1,1,1} + 4\Sigma_3\Sigma_{3,1,1,1} + 4\Sigma_{3,1}\Sigma_{3,1,1} - \Sigma_{3,1,1,1,1,2} - \Sigma_{3,1,1,1,2,1} - \Sigma_{3,1,1,2,1,1}$$
$$- \Sigma_{3,1,2,1,1,1} - \Sigma_{3,2,1,1,1,1} - \Sigma_{4,1,1,1,1,1})$$
$$- V_{00}^4(-15\Sigma_1^2\Sigma_7 + 5\Sigma_1\Sigma_{1,1,6} + 5\Sigma_1\Sigma_{1,2,5} + 5\Sigma_1\Sigma_{1,3,4} + 5\Sigma_1\Sigma_{1,4,3} + 5\Sigma_1\Sigma_{1,5,2} + 5\Sigma_1\Sigma_{1,6,1} - 30\Sigma_1\Sigma_2\Sigma_6 + 5\Sigma_1\Sigma_{2,1,5}$$
$$+ 5\Sigma_1\Sigma_{2,2,4} + 5\Sigma_1\Sigma_{2,3,3} + 5\Sigma_1\Sigma_{2,4,2} + 5\Sigma_1\Sigma_{2,5,1} - 30\Sigma_1\Sigma_3\Sigma_5 + 5\Sigma_1\Sigma_{3,1,4} + 5\Sigma_1\Sigma_{3,2,3} + 5\Sigma_1\Sigma_{3,3,2} + 5\Sigma_1\Sigma_{3,4,1} - 15\Sigma_1\Sigma_4^2$$
$$+ 5\Sigma_1\Sigma_{4,1,3} + 5\Sigma_1\Sigma_{4,2,2} + 5\Sigma_1\Sigma_{4,3,1} + 5\Sigma_1\Sigma_{5,1,2} + 5\Sigma_1\Sigma_{5,2,1} + 5\Sigma_1\Sigma_{6,1,1} + 5\Sigma_{1,1}\Sigma_{1,6} + 5\Sigma_{1,1}\Sigma_{2,5} + 5\Sigma_{1,1}\Sigma_{3,4} + 5\Sigma_{1,1}\Sigma_{4,3}$$
$$+ 5\Sigma_{1,1}\Sigma_{5,2} + 5\Sigma_{1,1}\Sigma_{6,1} + 5\Sigma_{1,1,1}\Sigma_6 - \Sigma_{1,1,1,1,5} - \Sigma_{1,1,1,2,4} - \Sigma_{1,1,1,3,3} - \Sigma_{1,1,1,4,2} - \Sigma_{1,1,1,5,1} + 5\Sigma_{1,1,2}\Sigma_5 - \Sigma_{1,1,2,1,4}$$
$$- \Sigma_{1,1,2,2,3} - \Sigma_{1,1,2,3,2} - \Sigma_{1,1,2,4,1} + 5\Sigma_{1,1,3}\Sigma_4 - \Sigma_{1,1,3,1,3} - \Sigma_{1,1,3,2,2} - \Sigma_{1,1,3,3,1} + 5\Sigma_{1,1,4}\Sigma_3 - \Sigma_{1,1,4,1,2} - \Sigma_{1,1,4,2,1} + 5\Sigma_{1,1,5}\Sigma_2$$

$$
\begin{aligned}
&- \Sigma_{1,1,5,1,1} + 5\Sigma_{1,2}\Sigma_{1,5} + 5\Sigma_{1,2}\Sigma_{2,4} + 5\Sigma_{1,2}\Sigma_{3,3} + 5\Sigma_{1,2}\Sigma_{4,2} + 5\Sigma_{1,2}\Sigma_{5,1} + 5\Sigma_{1,2,1}\Sigma_5 - \Sigma_{1,2,1,1,4} - \Sigma_{1,2,1,2,3} - \Sigma_{1,2,1,3,2} \\
&- \Sigma_{1,2,1,4,1} + 5\Sigma_{1,2,2}\Sigma_4 - \Sigma_{1,2,2,1,3} - \Sigma_{1,2,2,2,2} - \Sigma_{1,2,2,3,1} + 5\Sigma_{1,2,3}\Sigma_3 - \Sigma_{1,2,3,1,2} - \Sigma_{1,2,3,2,1} + 5\Sigma_{1,2,4}\Sigma_2 - \Sigma_{1,2,4,1,1} \\
&+ 5\Sigma_{1,3}\Sigma_{1,4} + 5\Sigma_{1,3}\Sigma_{2,3} + 5\Sigma_{1,3}\Sigma_{3,2} + 5\Sigma_{1,3}\Sigma_{4,1} + 5\Sigma_{1,3,1}\Sigma_4 - \Sigma_{1,3,1,1,3} - \Sigma_{1,3,1,2,2} - \Sigma_{1,3,1,3,1} + 5\Sigma_{1,3,2}\Sigma_3 - \Sigma_{1,3,2,1,2} \\
&- \Sigma_{1,3,2,2,1} + 5\Sigma_{1,3,3}\Sigma_2 - \Sigma_{1,3,3,1,1} + 5\Sigma_{1,4}\Sigma_{2,2} + 5\Sigma_{1,4}\Sigma_{3,1} + 5\Sigma_{1,4,1}\Sigma_3 - \Sigma_{1,4,1,1,2} - \Sigma_{1,4,1,2,1} + 5\Sigma_{1,4,2}\Sigma_2 - \Sigma_{1,4,2,1,1} \\
&+ 5\Sigma_{1,5}\Sigma_{2,1} + 5\Sigma_{1,5,1}\Sigma_2 - \Sigma_{1,5,1,1,1} - 15\Sigma_2^2\Sigma_5 + 5\Sigma_2\Sigma_{2,1,4} + 5\Sigma_2\Sigma_{2,2,3} + 5\Sigma_2\Sigma_{2,3,2} + 5\Sigma_2\Sigma_{2,4,1} - 30\Sigma_2\Sigma_3\Sigma_4 \\
&+ 5\Sigma_2\Sigma_{3,1,3} + 5\Sigma_2\Sigma_{3,2,2} + 5\Sigma_2\Sigma_{3,3,1} + 5\Sigma_2\Sigma_{4,1,2} + 5\Sigma_2\Sigma_{4,2,1} + 5\Sigma_2\Sigma_{5,1,1} + 5\Sigma_{2,1}\Sigma_{2,4} + 5\Sigma_{2,1}\Sigma_{3,3} + 5\Sigma_{2,1}\Sigma_{4,2} \\
&+ 5\Sigma_{2,1}\Sigma_{5,1} + 5\Sigma_{2,1,1}\Sigma_5 - \Sigma_{2,1,1,1,4} - \Sigma_{2,1,1,2,3} - \Sigma_{2,1,1,3,2} - \Sigma_{2,1,1,4,1} + 5\Sigma_{2,1,2}\Sigma_4 - \Sigma_{2,1,2,1,3} - \Sigma_{2,1,2,2,2} - \Sigma_{2,1,2,3,1} \\
&+ 5\Sigma_{2,1,3}\Sigma_3 - \Sigma_{2,1,3,1,2} - \Sigma_{2,1,3,2,1} - \Sigma_{2,1,4,1,1} + 5\Sigma_{2,2}\Sigma_{2,3} + 5\Sigma_{2,2}\Sigma_{3,2} + 5\Sigma_{2,2}\Sigma_{4,1} + 5\Sigma_{2,2,1}\Sigma_4 - \Sigma_{2,2,1,1,3} - \Sigma_{2,2,1,2,2} \\
&- \Sigma_{2,2,1,3,1} + 5\Sigma_{2,2,2}\Sigma_3 - \Sigma_{2,2,2,1,2} - \Sigma_{2,2,2,2,1} - \Sigma_{2,2,3,1,1} + 5\Sigma_{2,3}\Sigma_{3,1} + 5\Sigma_{2,3,1}\Sigma_3 - \Sigma_{2,3,1,1,2} - \Sigma_{2,3,1,2,1} - \Sigma_{2,3,2,1,1} \\
&- \Sigma_{2,4,1,1,1} - 5\Sigma_3^3 + 5\Sigma_3\Sigma_{3,1,2} + 5\Sigma_3\Sigma_{3,2,1} + 5\Sigma_3\Sigma_{4,1,1} + 5\Sigma_{3,1}\Sigma_{3,2} + 5\Sigma_{3,1}\Sigma_{4,1} + 5\Sigma_{3,1,1}\Sigma_4 - \Sigma_{3,1,1,1,3} - \Sigma_{3,1,1,2,2} \\
&- \Sigma_{3,1,1,3,1} - \Sigma_{3,1,2,1,2} - \Sigma_{3,1,2,2,1} - \Sigma_{3,1,3,1,1} - \Sigma_{3,2,1,1,2} - \Sigma_{3,2,1,2,1} - \Sigma_{3,2,2,1,1} - \Sigma_{3,3,1,1,1} - \Sigma_{4,1,1,1,2} - \Sigma_{4,1,1,2,1} \\
&- \Sigma_{4,1,2,1,1} - \Sigma_{4,2,1,1,1} - \Sigma_{5,1,1,1,1}) \\
&- V_{00}^5(-6\Sigma_1\Sigma_{1,7} - 6\Sigma_1\Sigma_{2,6} - 6\Sigma_1\Sigma_{3,5} - 6\Sigma_1\Sigma_{4,4} - 6\Sigma_1\Sigma_{5,3} - 6\Sigma_1\Sigma_{6,2} - 6\Sigma_1\Sigma_{7,1} - 6\Sigma_{1,1}\Sigma_7 + \Sigma_{1,1,1,6} + \Sigma_{1,1,2,5} + \Sigma_{1,1,3,4} \\
&+ \Sigma_{1,1,4,3} + \Sigma_{1,1,5,2} + \Sigma_{1,1,6,1} - 6\Sigma_{1,2}\Sigma_6 + \Sigma_{1,2,1,5} + \Sigma_{1,2,2,4} + \Sigma_{1,2,3,3} + \Sigma_{1,2,4,2} + \Sigma_{1,2,5,1} - 6\Sigma_{1,3}\Sigma_5 + \Sigma_{1,3,1,4} + \Sigma_{1,3,2,3} + \Sigma_{1,3,3,2} \\
&+ \Sigma_{1,3,4,1} - 6\Sigma_{1,4}\Sigma_4 + \Sigma_{1,4,1,3} + \Sigma_{1,4,2,2} + \Sigma_{1,4,3,1} - 6\Sigma_{1,5}\Sigma_3 + \Sigma_{1,5,1,2} + \Sigma_{1,5,2,1} - 6\Sigma_{1,6}\Sigma_2 + \Sigma_{1,6,1,1} - 6\Sigma_2\Sigma_{2,5} - 6\Sigma_2\Sigma_{3,4} \\
&- 6\Sigma_2\Sigma_{4,3} - 6\Sigma_2\Sigma_{5,2} - 6\Sigma_2\Sigma_{6,1} - 6\Sigma_{2,1}\Sigma_6 + \Sigma_{2,1,1,5} + \Sigma_{2,1,2,4} + \Sigma_{2,1,3,3} + \Sigma_{2,1,4,2} + \Sigma_{2,1,5,1} - 6\Sigma_{2,2}\Sigma_5 + \Sigma_{2,2,1,4} + \Sigma_{2,2,2,3} \\
&+ \Sigma_{2,2,3,2} + \Sigma_{2,2,4,1} - 6\Sigma_{2,3}\Sigma_4 + \Sigma_{2,3,1,3} + \Sigma_{2,3,2,2} + \Sigma_{2,3,3,1} - 6\Sigma_{2,4}\Sigma_3 + \Sigma_{2,4,1,2} + \Sigma_{2,4,2,1} + \Sigma_{2,5,1,1} - 6\Sigma_3\Sigma_{3,3} - 6\Sigma_3\Sigma_{4,2} \\
&- 6\Sigma_3\Sigma_{5,1} - 6\Sigma_{3,1}\Sigma_5 + \Sigma_{3,1,1,4} + \Sigma_{3,1,2,3} + \Sigma_{3,1,3,2} + \Sigma_{3,1,4,1} - 6\Sigma_{3,2}\Sigma_4 + \Sigma_{3,2,1,3} + \Sigma_{3,2,2,2} + \Sigma_{3,2,3,1} + \Sigma_{3,3,1,2} + \Sigma_{3,3,2,1} \\
&+ \Sigma_{3,4,1,1} - 6\Sigma_4\Sigma_{4,1} + \Sigma_{4,1,1,3} + \Sigma_{4,1,2,2} + \Sigma_{4,1,3,1} + \Sigma_{4,2,1,2} + \Sigma_{4,2,2,1} + \Sigma_{4,3,1,1} + \Sigma_{5,1,1,2} + \Sigma_{5,1,2,1} + \Sigma_{5,2,1,1} + \Sigma_{6,1,1,1}) \\
&+ V_{00}^6(-7\Sigma_1\Sigma_8 + \Sigma_{1,1,7} + \Sigma_{1,2,6} + \Sigma_{1,3,5} + \Sigma_{1,4,4} + \Sigma_{1,5,3} + \Sigma_{1,6,2} + \Sigma_{1,7,1} - 7\Sigma_2\Sigma_7 + \Sigma_{2,1,6} + \Sigma_{2,2,5} + \Sigma_{2,3,4} + \Sigma_{2,4,3} + \Sigma_{2,5,2} \\
&+ \Sigma_{2,6,1} - 7\Sigma_3\Sigma_6 + \Sigma_{3,1,5} + \Sigma_{3,2,4} + \Sigma_{3,3,3} + \Sigma_{3,4,2} + \Sigma_{3,5,1} - 7\Sigma_4\Sigma_5 + \Sigma_{4,1,4} + \Sigma_{4,2,3} + \Sigma_{4,3,2} + \Sigma_{4,4,1} + \Sigma_{5,1,3} + \Sigma_{5,2,2} + \Sigma_{5,3,1} \\
&+ \Sigma_{6,1,2} + \Sigma_{6,2,1} + \Sigma_{7,1,1}) \\
&- V_{00}^7(\Sigma_{1,8} + \Sigma_{2,7} + \Sigma_{3,6} + \Sigma_{4,5} + \Sigma_{5,4} + \Sigma_{6,3} + \Sigma_{7,2} + \Sigma_{8,1}) \\
&+ V_{00}^8\Sigma_9
\end{aligned}
$$