# Available Operators (with up to n=3 indices)

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January 30, 2025

# X=V, n=2

## (1, 1) Block 1: Trace != 0, Symmetric, C = 1

Operator 1

$$O_1^{V(1,1),1} = O_{1,1} + O_{2,2} + O_{3,3} + O_{4,4}$$

$$K_1^{V(1,1),1} = \frac{i(E(p)^3 + E(p)m_N^2 - E(p)p_1^2 - E(p)p_2^2 - E(p)p_3^2 + 2m_N^3)}{(2E(p)(E(p) + m_N))}$$

## (3, 1) Block 1: Trace = 0, Symmetric, C = 1

Operator 2

$$O_1^{V(3,1),1} = O_{1,1} + O_{2,2} + O_{3,3} - 3O_{4,4}$$

$$K_1^{V(3,1),1} = \frac{i(-3E(p)^3 - 3E(p)m_N^2 - 5E(p)p_1^2 - 5E(p)p_2^2 - 5E(p)p_3^2 - 6m_N^3 - 8m_N p_1^2 - 8m_N p_2^2 - 8m_N p_3^2)}{(2E(p)(E(p) + m_N))}$$

Operator 3

$$O_2^{V(3,1),1} = O_{1,1} + O_{2,2} - 2O_{3,3}$$

$$K_2^{V(3,1),1} = \frac{i(-p_1^2 - p_2^2 + 2p_3^2)}{E(p)}$$

Operator 4

$$O_3^{V(3,1),1} = O_{1,1} - O_{2,2}$$

$$K_3^{V(3,1),1} = \frac{i(-p_1^2 + p_2^2)}{E(p)}$$

# (6, 1) Block 1: Trace = 0, Antisymmetric, C = 1

Operator 5

$$O_1^{V(6,1),1} = O_{1,2} - O_{2,1}$$

$$K_1^{V(6,1),1} = 0$$

Operator 6

$$O_2^{V(6,1),1} = O_{1,3} - O_{3,1}$$

$$K_2^{V(6,1),1} = 0$$

Operator 7

$$O_3^{V(6,1),1} = O_{2,3} - O_{3,2}$$

$$K_3^{V(6,1),1} = 0$$

Operator 8

$$O_4^{V(6,1),1} = O_{1,4} - O_{4,1}$$

$$K_4^{V(6,1),1} = 0$$

Operator 9

$$O_5^{V(6,1),1} = O_{2,4} - O_{4,2}$$

$$K_5^{V(6,1),1} = 0$$

Operator 10

$$O_6^{V(6,1),1} = O_{3,4} - O_{4,3}$$

$$K_6^{V(6,1),1} = 0$$

# (6, 3) Block 1: Trace = 0, Symmetric, C = 1

Operator 11

$$O_1^{V(6,3),1} = O_{1,2} + O_{2,1}$$

$$K_1^{V(6,3),1} = \frac{-2ip_1p_2}{E(p)}$$

Operator 12

$$O_2^{V(6,3),1} = O_{1,3} + O_{3,1}$$

$$K_2^{V(6,3),1} = \frac{-2ip_1p_3}{E(p)}$$

Operator 13

$$O_3^{V(6,3),1} = O_{2,3} + O_{3,2}$$

$$K_3^{V(6,3),1} = \frac{-2ip_2p_3}{E(p)}$$

Operator 14

$$O_4^{V(6,3),1} = O_{1,4} + O_{4,1}$$

$$K_4^{V(6,3),1} = \frac{2p_1(E(p)^2 + E(p)m_N)}{(E(p)(E(p) + m_N))}$$

Operator 15

$$O_5^{V(6,3),1} = O_{2,4} + O_{4,2}$$

$$K_5^{V(6,3),1} = \frac{2p_2(E(p)^2 + E(p)m_N)}{(E(p)(E(p) + m_N))}$$

Operator 16

$$O_6^{V(6,3),1} = O_{3,4} + O_{4,3}$$

$$K_6^{V(6,3),1} = \frac{2p_3(E(p)^2 + E(p)m_N)}{(E(p)(E(p) + m_N))}$$

# X=A, n=2

## (1, 4) Block 1: Trace != 0, Symmetric, C = -1

Operator 17

$$O_1^{A(1,4),1} = O_{1,1} + O_{2,2} + O_{3,3} + O_{4,4}$$

$$K_1^{A(1,4),1} = 0$$

## (3, 4) Block 1: Trace = 0, Symmetric, C = -1

Operator 18

$$O_1^{A(3,4),1} = O_{1,1} + O_{2,2} + O_{3,3} - 3O_{4,4}$$

$$K_1^{A(3,4),1} = \frac{4ip_3(E(p)^2 + E(p)m_N)}{(E(p)(E(p) + m_N))}$$

Operator 19

$$O_2^{A(3,4),1} = O_{1,1} + O_{2,2} - 2O_{3,3}$$

$$K_2^{A(3,4),1} = \frac{ip_3(-2E(p)m_N - 2m_N^2 + p_1^2 + p_2^2 - 2p_3^2)}{(E(p)(E(p) + m_N))}$$

Operator 20

$$O_3^{A(3,4),1} = O_{1,1} - O_{2,2}$$

$$K_3^{A(3,4),1} = \frac{ip_3(p_1^2 - p_2^2)}{(E(p)(E(p) + m_N))}$$

# (6, 1) Block 1: Trace = 0, Antisymmetric, C = -1

Operator 21

$$O_1^{A(6,1),1} = O_{3,4} - O_{4,3}$$

$$K_1^{A(6,1),1} = \frac{(-E(p)^3 - E(p)m_N^2 + E(p)p_1^2 + E(p)p_2^2 + E(p)p_3^2 - 2m_N^3 - 2m_N p_1^2 - 2m_N p_2^2)}{(2E(p)(E(p) + m_N))}$$

Operator 22

$$O_2^{A(6,1),1} = O_{2,4} - O_{4,2}$$

$$K_2^{A(6,1),1} = \frac{m_N p_2 p_3}{(E(p)(E(p) + m_N))}$$

Operator 23

$$O_3^{A(6,1),1} = O_{1,4} - O_{4,1}$$

$$K_3^{A(6,1),1} = \frac{m_N p_1 p_3}{(E(p)(E(p) + m_N))}$$

Operator 24

$$O_4^{A(6,1),1} = O_{2,3} - O_{3,2}$$

$$K_4^{A(6,1),1} = \frac{-i m_N p_2}{E(p)}$$

Operator 25

$$O_5^{A(6,1),1} = O_{1,3} - O_{3,1}$$

$$K_5^{A(6,1),1} = \frac{-i m_N p_1}{E(p)}$$

Operator 26

$$O_6^{A(6,1),1} = O_{1,2} - O_{2,1}$$

$$K_6^{A(6,1),1} = 0$$

# (6, 4) Block 1: Trace = 0, Symmetric, C = -1

Operator 27

$$O_1^{A(6,4),1} = O_{1,2} + O_{2,1}$$

$$K_1^{A(6,4),1} = \frac{2ip_1p_2p_3}{(E(p)(E(p) + m_N))}$$

Operator 28

$$O_2^{A(6,4),1} = O_{1,3} + O_{3,1}$$

$$K_2^{A(6,4),1} = \frac{ip_1(E(p)m_N + m_N^2 + 2p_3^2)}{(E(p)(E(p) + m_N))}$$

Operator 29

$$O_3^{A(6,4),1} = O_{2,3} + O_{3,2}$$

$$K_3^{A(6,4),1} = \frac{ip_2(E(p)m_N + m_N^2 + 2p_3^2)}{(E(p)(E(p) + m_N))}$$

Operator 30

$$O_4^{A(6,4),1} = O_{1,4} + O_{4,1}$$

$$K_4^{A(6,4),1} = \frac{-p_1p_3(2E(p) + m_N)}{(E(p)(E(p) + m_N))}$$

Operator 31

$$O_5^{A(6,4),1} = O_{2,4} + O_{4,2}$$

$$K_5^{A(6,4),1} = \frac{-p_2p_3(2E(p) + m_N)}{(E(p)(E(p) + m_N))}$$

Operator 32

$$O_6^{A(6,4),1} = O_{3,4} + O_{4,3}$$

$$K_6^{A(6,4),1} = \frac{(-E(p)^3 - 2E(p)^2m_N - E(p)m_N^2 + E(p)p_1^2 + E(p)p_2^2 - 3E(p)p_3^2 - 2m_Np_3^2)}{(2E(p)(E(p) + m_N))}$$

# X=T, n=3

## (4, 1) Block 1: Trace = 0, Mixed Symmetry, C = 1

Operator 33

$$O_1^{T(4,1),1} = O_{2,1,2} + O_{3,1,3} + O_{4,1,4}$$

$$K_1^{T(4,1),1} = 0$$

Operator 34

$$O_2^{T(4,1),1} = O_{1,2,1} + O_{3,2,3} + O_{4,2,4}$$

$$K_2^{T(4,1),1} = 0$$

Operator 35

$$O_3^{T(4,1),1} = O_{1,3,1} + O_{2,3,2} + O_{4,3,4}$$

$$K_3^{T(4,1),1} = 0$$

Operator 36

$$O_4^{T(4,1),1} = O_{1,4,1} + O_{2,4,2} + O_{3,4,3}$$

$$K_4^{T(4,1),1} = 0$$

## (4, 1) Block 2: Trace = 0, Mixed Symmetry, C = 1

Operator 37

$$O_1^{T(4,1),2} = O_{2,2,1} + O_{3,3,1} + O_{4,4,1}$$

$$K_1^{T(4,1),2} = 0$$

Operator 38

$$O_2^{T(4,1),2} = O_{1,1,2} + O_{3,3,2} + O_{4,4,2}$$

$$K_2^{T(4,1),2} = 0$$

Operator 39

$$O_3^{T(4,1),2} = O_{1,1,3} + O_{2,2,3} + O_{4,4,3}$$

$$K_3^{T(4,1),2} = 0$$

Operator 40

$$O_4^{T(4,1),2} = O_{1,1,4} + O_{2,2,4} + O_{3,3,4}$$

$$K_4^{T(4,1),2} = 0$$

# (4, 1) Block 3: Trace = 0, Symmetric, C = 1

Operator 41

$$O_1^{T(4,1),3} = O_{1,1,1}$$

$$K_1^{T(4,1),3} = 0$$

Operator 42

$$O_2^{T(4,1),3} = O_{2,2,2}$$

$$K_2^{T(4,1),3} = 0$$

Operator 43

$$O_3^{T(4,1),3} = O_{3,3,3}$$

$$K_3^{T(4,1),3} = 0$$

Operator 44

$$O_4^{T(4,1),3} = O_{4,4,4}$$

$$K_4^{T(4,1),3} = 0$$

## (4, 1) Block 4: Trace = 0, Mixed Symmetry, C = 1

Operator 45

$$O_1^{T(4,1),4} = O_{1,2,2} + O_{1,3,3} + O_{1,4,4}$$

$$K_1^{T(4,1),4} = 0$$

Operator 46

$$O_2^{T(4,1),4} = O_{2,1,1} + O_{2,3,3} + O_{2,4,4}$$

$$K_2^{T(4,1),4} = 0$$

Operator 47

$$O_3^{T(4,1),4} = O_{3,1,1} + O_{3,2,2} + O_{3,4,4}$$

$$K_3^{T(4,1),4} = 0$$

Operator 48

$$O_4^{T(4,1),4} = O_{4,1,1} + O_{4,2,2} + O_{4,3,3}$$

$$K_4^{T(4,1),4} = 0$$

# (4, 2) Block 1: Trace = 0, Symmetric, C = 1

Operator 49

$$O_1^{T(4,2),1} = O_{2,3,4} + O_{2,4,3} + O_{3,2,4} + O_{3,4,2} + O_{4,2,3} + O_{4,3,2}$$

$$K_1^{T(4,2),1} = 0$$

Operator 50

$$O_2^{T(4,2),1} = O_{1,3,4} + O_{1,4,3} + O_{3,1,4} + O_{3,4,1} + O_{4,1,3} + O_{4,3,1}$$

$$K_2^{T(4,2),1} = 0$$

Operator 51

$$O_3^{T(4,2),1} = O_{1,2,4} + O_{1,4,2} + O_{2,1,4} + O_{2,4,1} + O_{4,1,2} + O_{4,2,1}$$

$$K_3^{T(4,2),1} = 0$$

Operator 52

$$O_4^{T(4,2),1} = O_{1,2,3} + O_{1,3,2} + O_{2,1,3} + O_{2,3,1} + O_{3,1,2} + O_{3,2,1}$$

$$K_4^{T(4,2),1} = 0$$

# (4, 4) Block 1: Trace = 0, Antisymmetric, C = 1

Operator 53

$$O_1^{T(4,4),1} = O_{2,3,4} - O_{2,4,3} - O_{3,2,4} + O_{3,4,2} + O_{4,2,3} - O_{4,3,2}$$

$$K_1^{T(4,4),1} = \frac{-4m_N p_1 p_3}{(E(p)(E(p) + m_N))}$$

Operator 54

$$O_2^{T(4,4),1} = O_{1,3,4} - O_{1,4,3} - O_{3,1,4} + O_{3,4,1} + O_{4,1,3} - O_{4,3,1}$$

$$K_2^{T(4,4),1} = \frac{4m_N p_2 p_3}{(E(p)(E(p) + m_N))}$$

Operator 55

$$O_3^{T(4,4),1} = O_{1,2,4} - O_{1,4,2} - O_{2,1,4} + O_{2,4,1} + O_{4,1,2} - O_{4,2,1}$$

$$K_3^{T(4,4),1} = \frac{2(-E(p)^3 - E(p)m_N^2 + E(p)p_1^2 + E(p)p_2^2 + E(p)p_3^2 - 2m_N^3 - 2m_N p_3^2)}{(E(p)(E(p) + m_N))}$$

Operator 56

$$O_4^{T(4,4),1} = O_{1,2,3} - O_{1,3,2} - O_{2,1,3} + O_{2,3,1} + O_{3,1,2} - O_{3,2,1}$$

$$K_4^{T(4,4),1} = \frac{4im_N p_3}{E(p)}$$

# (8, 1) Block 1: Trace = 0, Mixed Symmetry, C = 1

Operator 57

$$O_1^{T(8,1),1} = O_{2,1,2} - O_{3,1,3}/2 - O_{4,1,4}/2$$

$$K_1^{T(8,1),1} = \frac{-3ip_2(E(p)m_N + m_N^2 + p_1^2 + p_2^2)}{(E(p)(E(p) + m_N))}$$

Operator 58

$$O_2^{T(8,1),1} = O_{1,2,1} - O_{3,2,3}/2 - O_{4,2,4}/2$$

$$K_2^{T(8,1),1} = \frac{3ip_1(E(p)m_N + m_N^2 + p_1^2 + p_2^2)}{(E(p)(E(p) + m_N))}$$

Operator 59

$$O_3^{T(8,1),1} = O_{1,3,1} + O_{2,3,2} - 2O_{4,3,4}$$

$$K_3^{T(8,1),1} = 0$$

Operator 60

$$O_4^{T(8,1),1} = O_{1,4,1} + O_{2,4,2} - 2O_{3,4,3}$$

$$K_4^{T(8,1),1} = 0$$

Operator 61

$$O_5^{T(8,1),1} = O_{3,1,3} - O_{4,1,4}$$

$$K_5^{T(8,1),1} = \frac{-2ip_2(E(p)m_N + m_N^2 + p_1^2 + p_2^2 + 2p_3^2)}{(E(p)(E(p) + m_N))}$$

Operator 62

$$O_6^{T(8,1),1} = O_{3,2,3} - O_{4,2,4}$$

$$K_6^{T(8,1),1} = \frac{2ip_1(E(p)m_N + m_N^2 + p_1^2 + p_2^2 + 2p_3^2)}{(E(p)(E(p) + m_N))}$$

Operator 63

$$O_7^{T(8,1),1} = O_{1,3,1} - O_{2,3,2}$$

$$K_7^{T(8,1),1} = \frac{4ip_1p_2p_3}{(E(p)(E(p) + m_N))}$$

Operator 64

$$O_8^{T(8,1),1} = O_{1,4,1} - O_{2,4,2}$$

$$K_8^{T(8,1),1} = \frac{-4p_1p_2}{E(p)}$$

# (8, 1) Block 2: Trace = 0, Mixed Symmetry, C = 1

Operator 65

$$O_1^{T(8,1),2} = O_{2,2,1} - O_{3,3,1}/2 - O_{4,4,1}/2$$

$$K_1^{T(8,1),2} = 0$$

Operator 66

$$O_2^{T(8,1),2} = O_{1,1,2} - O_{3,3,2}/2 - O_{4,4,2}/2$$

$$K_2^{T(8,1),2} = 0$$

Operator 67

$$O_3^{T(8,1),2} = O_{1,1,3} + O_{2,2,3} - 2O_{4,4,3}$$

$$K_3^{T(8,1),2} = 0$$

Operator 68

$$O_4^{T(8,1),2} = O_{1,1,4} + O_{2,2,4} - 2O_{3,3,4}$$

$$K_4^{T(8,1),2} = 0$$

Operator 69

$$O_5^{T(8,1),2} = O_{3,3,1} - O_{4,4,1}$$

$$K_5^{T(8,1),2} = 0$$

Operator 70

$$O_6^{T(8,1),2} = O_{3,3,2} - O_{4,4,2}$$

$$K_6^{T(8,1),2} = 0$$

Operator 71

$$O_7^{T(8,1),2} = O_{1,1,3} - O_{2,2,3}$$

$$K_7^{T(8,1),2} = 0$$

Operator 72

$$O_8^{T(8,1),2} = O_{1,1,4} - O_{2,2,4}$$

$$K_8^{T(8,1),2} = 0$$

# (8, 1) Block 3: Trace = 0, Mixed Symmetry, C = 1

Operator 73

$$O_1^{T(8,1),3} = O_{1,2,2} - O_{1,3,3}/2 - O_{1,4,4}/2$$

$$K_1^{T(8,1),3} = \frac{3ip_2(E(p)m_N + m_N^2 + p_1^2 + p_2^2)}{(E(p)(E(p) + m_N))}$$

Operator 74

$$O_2^{T(8,1),3} = O_{2,1,1} - O_{2,3,3}/2 - O_{2,4,4}/2$$

$$K_2^{T(8,1),3} = \frac{-3ip_1(E(p)m_N + m_N^2 + p_1^2 + p_2^2)}{(E(p)(E(p) + m_N))}$$

Operator 75

$$O_3^{T(8,1),3} = O_{3,1,1} + O_{3,2,2} - 2O_{3,4,4}$$

$$K_3^{T(8,1),3} = 0$$

Operator 76

$$O_4^{T(8,1),3} = O_{4,1,1} + O_{4,2,2} - 2O_{4,3,3}$$

$$K_4^{T(8,1),3} = 0$$

Operator 77

$$O_5^{T(8,1),3} = O_{1,3,3} - O_{1,4,4}$$

$$K_5^{T(8,1),3} = \frac{2ip_2(E(p)m_N + m_N^2 + p_1^2 + p_2^2 + 2p_3^2)}{(E(p)(E(p) + m_N))}$$

Operator 78

$$O_6^{T(8,1),3} = O_{2,3,3} - O_{2,4,4}$$

$$K_6^{T(8,1),3} = \frac{-2ip_1(E(p)m_N + m_N^2 + p_1^2 + p_2^2 + 2p_3^2)}{(E(p)(E(p) + m_N))}$$

Operator 79

$$O_7^{T(8,1),3} = O_{3,1,1} - O_{3,2,2}$$

$$K_7^{T(8,1),3} = \frac{-4ip_1p_2p_3}{(E(p)(E(p) + m_N))}$$

Operator 80

$$O_8^{T(8,1),3} = O_{4,1,1} - O_{4,2,2}$$

$$K_8^{T(8,1),3} = \frac{4p_1p_2}{E(p)}$$

# (8, 2) Block 1: Trace = 0, Mixed Symmetry, C = 1

Operator 81

$$O_1^{T(8,2),1} = O_{2,3,4} + O_{2,4,3} - O_{3,2,4} - O_{4,2,3}$$

$$K_1^{T(8,2),1} = \frac{4p_1p_3(2E(p) + m_N)}{(E(p)(E(p) + m_N))}$$

Operator 82

$$O_2^{T(8,2),1} = O_{1,3,4} + O_{1,4,3} - O_{3,1,4} - O_{4,1,3}$$

$$K_2^{T(8,2),1} = \frac{-4p_2p_3(2E(p) + m_N)}{(E(p)(E(p) + m_N))}$$

Operator 83

$$O_3^{T(8,2),1} = O_{1,4,2} + O_{2,4,1} - O_{4,1,2} - O_{4,2,1}$$

$$K_3^{T(8,2),1} = \frac{4(p_1^2 - p_2^2)}{E(p)}$$

Operator 84

$$O_4^{T(8,2),1} = O_{1,3,2} + O_{2,3,1} - O_{3,1,2} - O_{3,2,1}$$

$$K_4^{T(8,2),1} = \frac{4ip_3(-p_1^2 + p_2^2)}{(E(p)(E(p) + m_N))}$$

Operator 85

$$O_5^{T(8,2),1} = O_{2,3,4} - O_{2,4,3} - O_{3,2,4} - 2O_{3,4,2} + O_{4,2,3} + 2O_{4,3,2}$$

$$K_5^{T(8,2),1} = \frac{-4m_Np_1p_3}{(E(p)(E(p) + m_N))}$$

Operator 86

$$O_6^{T(8,2),1} = O_{1,3,4} - O_{1,4,3} - O_{3,1,4} - 2O_{3,4,1} + O_{4,1,3} + 2O_{4,3,1}$$

$$K_6^{T(8,2),1} = \frac{4m_Np_2p_3}{(E(p)(E(p) + m_N))}$$

Operator 87

$$O_7^{T(8,2),1} = O_{1,2,4} + O_{1,4,2}/2 - O_{2,1,4} - O_{2,4,1}/2 - O_{4,1,2}/2 + O_{4,2,1}/2$$

$$K_7^{T(8,2),1} = \frac{2(-E(p)^3 - E(p)m_N^2 - 2E(p)p_1^2 - 2E(p)p_2^2 + E(p)p_3^2 - 2m_N^3 - 3m_Np_1^2 - 3m_Np_2^2 - 2m_Np_3^2)}{(E(p)(E(p) + m_N))}$$

Operator 88

$$O_8^{T(8,2),1} = O_{1,2,3} + O_{1,3,2}/2 - O_{2,1,3} - O_{2,3,1}/2 - O_{3,1,2}/2 + O_{3,2,1}/2$$

$$K_8^{T(8,2),1} = \frac{2ip_3(2E(p)m_N + 2m_N^2 + 3p_1^2 + 3p_2^2)}{(E(p)(E(p) + m_N))}$$

# (8, 2) Block 2: Trace = 0, Mixed Symmetry, C = 1

Operator 89

$$O_1^{T(8,2),2} = O_{2,3,4} + O_{2,4,3} - O_{3,4,2} - O_{4,3,2}$$

$$K_1^{T(8,2),2} = \frac{2p_1 p_3 (2E(p) + m_N)}{(E(p)(E(p) + m_N))}$$

Operator 90

$$O_2^{T(8,2),2} = O_{1,3,4} + O_{1,4,3} - O_{3,4,1} - O_{4,3,1}$$

$$K_2^{T(8,2),2} = \frac{-2p_2 p_3 (2E(p) + m_N)}{(E(p)(E(p) + m_N))}$$

Operator 91

$$O_3^{T(8,2),2} = O_{1,2,4} + O_{2,1,4} - O_{4,1,2} - O_{4,2,1}$$

$$K_3^{T(8,2),2} = \frac{2(p_1^2 - p_2^2)}{E(p)}$$

Operator 92

$$O_4^{T(8,2),2} = O_{1,2,3} + O_{2,1,3} - O_{3,1,2} - O_{3,2,1}$$

$$K_4^{T(8,2),2} = \frac{2ip_3(-p_1^2 + p_2^2)}{(E(p)(E(p) + m_N))}$$

Operator 93

$$O_5^{T(8,2),2} = O_{2,3,4} - O_{2,4,3} + 2O_{3,2,4} + O_{3,4,2} - 2O_{4,2,3} - O_{4,3,2}$$

$$K_5^{T(8,2),2} = \frac{2m_N p_1 p_3}{(E(p)(E(p) + m_N))}$$

Operator 94

$$O_6^{T(8,2),2} = O_{1,3,4} - O_{1,4,3} + 2O_{3,1,4} + O_{3,4,1} - 2O_{4,1,3} - O_{4,3,1}$$

$$K_6^{T(8,2),2} = \frac{-2m_N p_2 p_3}{(E(p)(E(p) + m_N))}$$

Operator 95

$$O_7^{T(8,2),2} = O_{1,2,4} + 2O_{1,4,2} - O_{2,1,4} - 2O_{2,4,1} + O_{4,1,2} - O_{4,2,1}$$

$$K_7^{T(8,2),2} = \frac{2(-E(p)^3 - E(p)m_N^2 - 2E(p)p_1^2 - 2E(p)p_2^2 + E(p)p_3^2 - 2m_N^3 - 3m_N p_1^2 - 3m_N p_2^2 - 2m_N p_3^2)}{(E(p)(E(p) + m_N))}$$

Operator 96

$$O_8^{T(8,2),2} = O_{1,2,3} + 2O_{1,3,2} - O_{2,1,3} - 2O_{2,3,1} + O_{3,1,2} - O_{3,2,1}$$

$$K_8^{T(8,2),2} = \frac{2ip_3(2E(p)m_N + 2m_N^2 + 3p_1^2 + 3p_2^2)}{(E(p)(E(p) + m_N))}$$

# X=V, n=3

## (4, 1) Block 1: Trace = 0, Mixed Symmetry, C = mixed

Operator 97

$$O_1^{V(4,1),1} = O_{2,1,2} + O_{3,1,3} + O_{4,1,4}$$

$$K_1^{V(4,1),1} = \frac{ip_1(E(p)^3 + E(p)m_N^2 + E(p)p_1^2 - E(p)p_2^2 - E(p)p_3^2 + 2m_N^3 + 2m_N p_1^2)}{(2E(p)(E(p) + m_N))}$$

Operator 98

$$O_2^{V(4,1),1} = O_{1,2,1} + O_{3,2,3} + O_{4,2,4}$$

$$K_2^{V(4,1),1} = \frac{ip_2(E(p)^3 + E(p)m_N^2 - E(p)p_1^2 + E(p)p_2^2 - E(p)p_3^2 + 2m_N^3 + 2m_N p_2^2)}{(2E(p)(E(p) + m_N))}$$

Operator 99

$$O_3^{V(4,1),1} = O_{1,3,1} + O_{2,3,2} + O_{4,3,4}$$

$$K_3^{V(4,1),1} = \frac{ip_3(E(p)^3 + E(p)m_N^2 - E(p)p_1^2 - E(p)p_2^2 + E(p)p_3^2 + 2m_N^3 + 2m_N p_3^2)}{(2E(p)(E(p) + m_N))}$$

Operator 100

$$O_4^{V(4,1),1} = O_{1,4,1} + O_{2,4,2} + O_{3,4,3}$$

$$K_4^{V(4,1),1} = p_1^2 + p_2^2 + p_3^2$$

# (4, 1) Block 2: Trace = 0, Mixed Symmetry, C = mixed

Operator 101

$$O_1^{V(4,1),2} = O_{2,2,1} + O_{3,3,1} + O_{4,4,1}$$

$$K_1^{V(4,1),2} = \frac{ip_1(E(p)^3 + E(p)m_N^2 + E(p)p_1^2 - E(p)p_2^2 - E(p)p_3^2 + 2m_N^3 + 2m_N p_1^2)}{(2E(p)(E(p) + m_N))}$$

Operator 102

$$O_2^{V(4,1),2} = O_{1,1,2} + O_{3,3,2} + O_{4,4,2}$$

$$K_2^{V(4,1),2} = \frac{ip_2(E(p)^3 + E(p)m_N^2 - E(p)p_1^2 + E(p)p_2^2 - E(p)p_3^2 + 2m_N^3 + 2m_N p_2^2)}{(2E(p)(E(p) + m_N))}$$

Operator 103

$$O_3^{V(4,1),2} = O_{1,1,3} + O_{2,2,3} + O_{4,4,3}$$

$$K_3^{V(4,1),2} = \frac{ip_3(E(p)^3 + E(p)m_N^2 - E(p)p_1^2 - E(p)p_2^2 + E(p)p_3^2 + 2m_N^3 + 2m_N p_3^2)}{(2E(p)(E(p) + m_N))}$$

Operator 104

$$O_4^{V(4,1),2} = O_{1,1,4} + O_{2,2,4} + O_{3,3,4}$$

$$K_4^{V(4,1),2} = p_1^2 + p_2^2 + p_3^2$$

# (4, 1) Block 3: Trace = 0, Symmetric, C = -1

Operator 105

$$O_1^{V(4,1),3} = O_{1,1,1}$$

$$K_1^{V(4,1),3} = \frac{-ip_1^3}{E(p)}$$

Operator 106

$$O_2^{V(4,1),3} = O_{2,2,2}$$

$$K_2^{V(4,1),3} = \frac{-ip_2^3}{E(p)}$$

Operator 107

$$O_3^{V(4,1),3} = O_{3,3,3}$$

$$K_3^{V(4,1),3} = \frac{-ip_3^3}{E(p)}$$

Operator 108

$$O_4^{V(4,1),3} = O_{4,4,4}$$

$$K_4^{V(4,1),3} = \frac{-E(p)(E(p)^2 + E(p)m_N)}{(E(p) + m_N)}$$

# (4, 1) Block 4: Trace = 0, Mixed Symmetry, C = -1

Operator 109

$$O_1^{V(4,1),4} = O_{1,2,2} + O_{1,3,3} + O_{1,4,4}$$

$$K_1^{V(4,1),4} = \frac{ip_1(m_N^2 + p_1^2)}{E(p)}$$

Operator 110

$$O_2^{V(4,1),4} = O_{2,1,1} + O_{2,3,3} + O_{2,4,4}$$

$$K_2^{V(4,1),4} = \frac{ip_2(m_N^2 + p_2^2)}{E(p)}$$

Operator 111

$$O_3^{V(4,1),4} = O_{3,1,1} + O_{3,2,2} + O_{3,4,4}$$

$$K_3^{V(4,1),4} = \frac{ip_3(m_N^2 + p_3^2)}{E(p)}$$

Operator 112

$$O_4^{V(4,1),4} = O_{4,1,1} + O_{4,2,2} + O_{4,3,3}$$

$$K_4^{V(4,1),4} = \frac{(p_1^2 + p_2^2 + p_3^2)(m_N(E(p) + m_N - p_3) + m_N(E(p) + m_N + p_3) + (E(p) - p_3)(E(p) + m_N - p_3) + (E(p) + p_3}{(4E(p)(E(p) + m_N))}$$

# (4, 2) Block 1: Trace = 0, Symmetric, C = -1

Operator 113

$$O_1^{V(4,2),1} = O_{2,3,4} + O_{2,4,3} + O_{3,2,4} + O_{3,4,2} + O_{4,2,3} + O_{4,3,2}$$

$$K_1^{V(4,2),1} = \frac{6p_2p_3(E(p)^2 + E(p)m_N)}{(E(p)(E(p) + m_N))}$$

Operator 114

$$O_2^{V(4,2),1} = O_{1,3,4} + O_{1,4,3} + O_{3,1,4} + O_{3,4,1} + O_{4,1,3} + O_{4,3,1}$$

$$K_2^{V(4,2),1} = \frac{6p_1p_3(E(p)^2 + E(p)m_N)}{(E(p)(E(p) + m_N))}$$

Operator 115

$$O_3^{V(4,2),1} = O_{1,2,4} + O_{1,4,2} + O_{2,1,4} + O_{2,4,1} + O_{4,1,2} + O_{4,2,1}$$

$$K_3^{V(4,2),1} = \frac{6p_1p_2(E(p)^2 + E(p)m_N)}{(E(p)(E(p) + m_N))}$$

Operator 116

$$O_4^{V(4,2),1} = O_{1,2,3} + O_{1,3,2} + O_{2,1,3} + O_{2,3,1} + O_{3,1,2} + O_{3,2,1}$$

$$K_4^{V(4,2),1} = \frac{-6ip_1p_2p_3}{E(p)}$$

# (4, 4) Block 1: Trace = 0, Antisymmetric, C = 1

Operator 117

$$O_1^{V(4,4),1} = O_{2,3,4} - O_{2,4,3} - O_{3,2,4} + O_{3,4,2} + O_{4,2,3} - O_{4,3,2}$$

$$K_1^{V(4,4),1} = 0$$

Operator 118

$$O_2^{V(4,4),1} = O_{1,3,4} - O_{1,4,3} - O_{3,1,4} + O_{3,4,1} + O_{4,1,3} - O_{4,3,1}$$

$$K_2^{V(4,4),1} = 0$$

Operator 119

$$O_3^{V(4,4),1} = O_{1,2,4} - O_{1,4,2} - O_{2,1,4} + O_{2,4,1} + O_{4,1,2} - O_{4,2,1}$$

$$K_3^{V(4,4),1} = 0$$

Operator 120

$$O_4^{V(4,4),1} = O_{1,2,3} - O_{1,3,2} - O_{2,1,3} + O_{2,3,1} + O_{3,1,2} - O_{3,2,1}$$

$$K_4^{V(4,4),1} = 0$$

# (8, 1) Block 1: Trace = 0, Mixed Symmetry, C = mixed

Operator 121

$$O_1^{V(8,1),1} = O_{2,1,2} - O_{3,1,3}/2 - O_{4,1,4}/2$$

$$K_1^{V(8,1),1} = \frac{ip_1(-E(p)^3 - E(p)m_N^2 - E(p)p_1^2 - 5E(p)p_2^2 + E(p)p_3^2 - 2m_N^3 - 2m_Np_1^2 - 6m_Np_2^2)}{(4E(p)(E(p) + m_N))}$$

Operator 122

$$O_2^{V(8,1),1} = O_{1,2,1} - O_{3,2,3}/2 - O_{4,2,4}/2$$

$$K_2^{V(8,1),1} = \frac{ip_2(-E(p)^3 - E(p)m_N^2 - 5E(p)p_1^2 - E(p)p_2^2 + E(p)p_3^2 - 2m_N^3 - 6m_Np_1^2 - 2m_Np_2^2)}{(4E(p)(E(p) + m_N))}$$

Operator 123

$$O_3^{V(8,1),1} = O_{1,3,1} + O_{2,3,2} - 2O_{4,3,4}$$

$$K_3^{V(8,1),1} = \frac{ip_3(-E(p)^3 - E(p)m_N^2 - 2E(p)p_1^2 - 2E(p)p_2^2 - E(p)p_3^2 - 2m_N^3 - 3m_Np_1^2 - 3m_Np_2^2 - 2m_Np_3^2)}{(E(p)(E(p) + m_N))}$$

Operator 124

$$O_4^{V(8,1),1} = O_{1,4,1} + O_{2,4,2} - 2O_{3,4,3}$$

$$K_4^{V(8,1),1} = p_1^2 + p_2^2 - 2p_3^2$$

Operator 125

$$O_5^{V(8,1),1} = O_{3,1,3} - O_{4,1,4}$$

$$K_5^{V(8,1),1} = \frac{-ip_1(E(p)^3 + 2E(p)^2m_N + E(p)m_N^2 + E(p)p_1^2 + E(p)p_2^2 + 3E(p)p_3^2 + 2m_Np_3^2)}{(2E(p)(E(p) + m_N))}$$

Operator 126

$$O_6^{V(8,1),1} = O_{3,2,3} - O_{4,2,4}$$

$$K_6^{V(8,1),1} = \frac{-ip_2(E(p)^3 + 2E(p)^2m_N + E(p)m_N^2 + E(p)p_1^2 + E(p)p_2^2 + 3E(p)p_3^2 + 2m_Np_3^2)}{(2E(p)(E(p) + m_N))}$$

Operator 127

$$O_7^{V(8,1),1} = O_{1,3,1} - O_{2,3,2}$$

$$K_7^{V(8,1),1} = \frac{ip_3(-p_1^2 + p_2^2)}{E(p)}$$

Operator 128

$$O_8^{V(8,1),1} = O_{1,4,1} - O_{2,4,2}$$

$$K_8^{V(8,1),1} = p_1^2 - p_2^2$$

# (8, 1) Block 2: Trace = 0, Mixed Symmetry, C = mixed

Operator 129

$$O_1^{V(8,1),2} = O_{2,2,1} - O_{3,3,1}/2 - O_{4,4,1}/2$$

$$K_1^{V(8,1),2} = \frac{ip_1(-E(p)^3 - E(p)m_N^2 - E(p)p_1^2 - 5E(p)p_2^2 + E(p)p_3^2 - 2m_N^3 - 2m_N p_1^2 - 6m_N p_2^2)}{(4E(p)(E(p) + m_N))}$$

Operator 130

$$O_2^{V(8,1),2} = O_{1,1,2} - O_{3,3,2}/2 - O_{4,4,2}/2$$

$$K_2^{V(8,1),2} = \frac{ip_2(-E(p)^3 - E(p)m_N^2 - 5E(p)p_1^2 - E(p)p_2^2 + E(p)p_3^2 - 2m_N^3 - 6m_N p_1^2 - 2m_N p_2^2)}{(4E(p)(E(p) + m_N))}$$

Operator 131

$$O_3^{V(8,1),2} = O_{1,1,3} + O_{2,2,3} - 2O_{4,4,3}$$

$$K_3^{V(8,1),2} = \frac{ip_3(-E(p)^3 - E(p)m_N^2 - 2E(p)p_1^2 - 2E(p)p_2^2 - E(p)p_3^2 - 2m_N^3 - 3m_N p_1^2 - 3m_N p_2^2 - 2m_N p_3^2)}{(E(p)(E(p) + m_N))}$$

Operator 132

$$O_4^{V(8,1),2} = O_{1,1,4} + O_{2,2,4} - 2O_{3,3,4}$$

$$K_4^{V(8,1),2} = p_1^2 + p_2^2 - 2p_3^2$$

Operator 133

$$O_5^{V(8,1),2} = O_{3,3,1} - O_{4,4,1}$$

$$K_5^{V(8,1),2} = \frac{-ip_1(E(p)^3 + 2E(p)^2 m_N + E(p)m_N^2 + E(p)p_1^2 + E(p)p_2^2 + 3E(p)p_3^2 + 2m_N p_3^2)}{(2E(p)(E(p) + m_N))}$$

Operator 134

$$O_6^{V(8,1),2} = O_{3,3,2} - O_{4,4,2}$$

$$K_6^{V(8,1),2} = \frac{-ip_2(E(p)^3 + 2E(p)^2 m_N + E(p)m_N^2 + E(p)p_1^2 + E(p)p_2^2 + 3E(p)p_3^2 + 2m_N p_3^2)}{(2E(p)(E(p) + m_N))}$$

Operator 135

$$O_7^{V(8,1),2} = O_{1,1,3} - O_{2,2,3}$$

$$K_7^{V(8,1),2} = \frac{ip_3(-p_1^2 + p_2^2)}{E(p)}$$

Operator 136

$$O_8^{V(8,1),2} = O_{1,1,4} - O_{2,2,4}$$

$$K_8^{V(8,1),2} = p_1^2 - p_2^2$$

# (8, 1) Block 3: Trace = 0, Mixed Symmetry, C = -1

Operator 137

$$O_1^{V(8,1),3} = O_{1,2,2} - O_{1,3,3}/2 - O_{1,4,4}/2$$

$$K_1^{V(8,1),3} = \frac{-ip_1(m_N^2 + p_1^2 + 3p_2^2)}{(2E(p))}$$

Operator 138

$$O_2^{V(8,1),3} = O_{2,1,1} - O_{2,3,3}/2 - O_{2,4,4}/2$$

$$K_2^{V(8,1),3} = \frac{-ip_2(m_N^2 + 3p_1^2 + p_2^2)}{(2E(p))}$$

Operator 139

$$O_3^{V(8,1),3} = O_{3,1,1} + O_{3,2,2} - 2O_{3,4,4}$$

$$K_3^{V(8,1),3} = \frac{-ip_3(2m_N^2 + 3p_1^2 + 3p_2^2 + 2p_3^2)}{E(p)}$$

Operator 140

$$O_4^{V(8,1),3} = O_{4,1,1} + O_{4,2,2} - 2O_{4,3,3}$$

$$K_4^{V(8,1),3} = \frac{(p_1^2 + p_2^2 - 2p_3^2)(m_N(E(p) + m_N - p_3) + m_N(E(p) + m_N + p_3) + (E(p) - p_3)(E(p) + m_N - p_3) + (E(p) + p}{(4E(p)(E(p) + m_N))}$$

Operator 141

$$O_5^{V(8,1),3} = O_{1,3,3} - O_{1,4,4}$$

$$K_5^{V(8,1),3} = \frac{-ip_1(m_N^2 + p_1^2 + p_2^2 + 2p_3^2)}{E(p)}$$

Operator 142

$$O_6^{V(8,1),3} = O_{2,3,3} - O_{2,4,4}$$

$$K_6^{V(8,1),3} = \frac{-ip_2(m_N^2 + p_1^2 + p_2^2 + 2p_3^2)}{E(p)}$$

Operator 143

$$O_7^{V(8,1),3} = O_{3,1,1} - O_{3,2,2}$$

$$K_7^{V(8,1),3} = \frac{ip_3(-p_1^2 + p_2^2)}{E(p)}$$

Operator 144

$$O_8^{V(8,1),3} = O_{4,1,1} - O_{4,2,2}$$

$$K_8^{V(8,1),3} = \frac{(p_1^2 - p_2^2)(m_N(E(p) + m_N - p_3) + m_N(E(p) + m_N + p_3) + (E(p) - p_3)(E(p) + m_N - p_3) + (E(p) + p_3)(E(}{(4E(p)(E(p) + m_N))}$$

# (8, 2) Block 1: Trace = 0, Mixed Symmetry, C = mixed

### Operator 145

$$O_1^{V(8,2),1} = O_{2,3,4} + O_{2,4,3} - O_{3,2,4} - O_{4,2,3}$$
$$K_1^{V(8,2),1} = 0$$

### Operator 146

$$O_2^{V(8,2),1} = O_{1,3,4} + O_{1,4,3} - O_{3,1,4} - O_{4,1,3}$$
$$K_2^{V(8,2),1} = 0$$

### Operator 147

$$O_3^{V(8,2),1} = O_{1,4,2} + O_{2,4,1} - O_{4,1,2} - O_{4,2,1}$$
$$K_3^{V(8,2),1} = 0$$

### Operator 148

$$O_4^{V(8,2),1} = O_{1,3,2} + O_{2,3,1} - O_{3,1,2} - O_{3,2,1}$$
$$K_4^{V(8,2),1} = 0$$

### Operator 149

$$O_5^{V(8,2),1} = O_{2,3,4} - O_{2,4,3} - O_{3,2,4} - 2O_{3,4,2} + O_{4,2,3} + 2O_{4,3,2}$$
$$K_5^{V(8,2),1} = 0$$

### Operator 150

$$O_6^{V(8,2),1} = O_{1,3,4} - O_{1,4,3} - O_{3,1,4} - 2O_{3,4,1} + O_{4,1,3} + 2O_{4,3,1}$$
$$K_6^{V(8,2),1} = 0$$

### Operator 151

$$O_7^{V(8,2),1} = O_{1,2,4} + O_{1,4,2}/2 - O_{2,1,4} - O_{2,4,1}/2 - O_{4,1,2}/2 + O_{4,2,1}/2$$
$$K_7^{V(8,2),1} = 0$$

### Operator 152

$$O_8^{V(8,2),1} = O_{1,2,3} + O_{1,3,2}/2 - O_{2,1,3} - O_{2,3,1}/2 - O_{3,1,2}/2 + O_{3,2,1}/2$$
$$K_8^{V(8,2),1} = 0$$

# (8, 2) Block 2: Trace = 0, Mixed Symmetry, C = mixed

Operator 153

$$O_1^{V(8,2),2} = O_{2,3,4} + O_{2,4,3} - O_{3,4,2} - O_{4,3,2}$$

$$K_1^{V(8,2),2} = 0$$

Operator 154

$$O_2^{V(8,2),2} = O_{1,3,4} + O_{1,4,3} - O_{3,4,1} - O_{4,3,1}$$

$$K_2^{V(8,2),2} = 0$$

Operator 155

$$O_3^{V(8,2),2} = O_{1,2,4} + O_{2,1,4} - O_{4,1,2} - O_{4,2,1}$$

$$K_3^{V(8,2),2} = 0$$

Operator 156

$$O_4^{V(8,2),2} = O_{1,2,3} + O_{2,1,3} - O_{3,1,2} - O_{3,2,1}$$

$$K_4^{V(8,2),2} = 0$$

Operator 157

$$O_5^{V(8,2),2} = O_{2,3,4} - O_{2,4,3} + 2O_{3,2,4} + O_{3,4,2} - 2O_{4,2,3} - O_{4,3,2}$$

$$K_5^{V(8,2),2} = 0$$

Operator 158

$$O_6^{V(8,2),2} = O_{1,3,4} - O_{1,4,3} + 2O_{3,1,4} + O_{3,4,1} - 2O_{4,1,3} - O_{4,3,1}$$

$$K_6^{V(8,2),2} = 0$$

Operator 159

$$O_7^{V(8,2),2} = O_{1,2,4} + 2O_{1,4,2} - O_{2,1,4} - 2O_{2,4,1} + O_{4,1,2} - O_{4,2,1}$$

$$K_7^{V(8,2),2} = 0$$

Operator 160

$$O_8^{V(8,2),2} = O_{1,2,3} + 2O_{1,3,2} - O_{2,1,3} - 2O_{2,3,1} + O_{3,1,2} - O_{3,2,1}$$

$$K_8^{V(8,2),2} = 0$$

# X=A, n=3

## (4, 1) Block 1: Trace = 0, Antisymmetric, C = -1

Operator 161

$$O_1^{A(4,1),1} = O_{2,3,4} - O_{2,4,3} - O_{3,2,4} + O_{3,4,2} + O_{4,2,3} - O_{4,3,2}$$

$$K_1^{A(4,1),1} = 0$$

Operator 162

$$O_2^{A(4,1),1} = O_{1,3,4} - O_{1,4,3} - O_{3,1,4} + O_{3,4,1} + O_{4,1,3} - O_{4,3,1}$$

$$K_2^{A(4,1),1} = 0$$

Operator 163

$$O_3^{A(4,1),1} = O_{1,2,4} - O_{1,4,2} - O_{2,1,4} + O_{2,4,1} + O_{4,1,2} - O_{4,2,1}$$

$$K_3^{A(4,1),1} = 0$$

Operator 164

$$O_4^{A(4,1),1} = O_{1,2,3} - O_{1,3,2} - O_{2,1,3} + O_{2,3,1} + O_{3,1,2} - O_{3,2,1}$$

$$K_4^{A(4,1),1} = 0$$

## (4, 3) Block 1: Trace = 0, Symmetric, C = 1

Operator 165

$$O_1^{A(4,3),1} = O_{2,3,4} + O_{2,4,3} + O_{3,2,4} + O_{3,4,2} + O_{4,2,3} + O_{4,3,2}$$

$$K_1^{A(4,3),1} = \frac{-p_2\left(E(p)^3 + 2E(p)^2 m_N + E(p)m_N^2 - E(p)p_1^2 - E(p)p_2^2 + 5E(p)p_3^2 + 2m_N p_3^2\right)}{(E(p)(E(p) + m_N))}$$

Operator 166

$$O_2^{A(4,3),1} = O_{1,3,4} + O_{1,4,3} + O_{3,1,4} + O_{3,4,1} + O_{4,1,3} + O_{4,3,1}$$

$$K_2^{A(4,3),1} = \frac{-p_1\left(E(p)^3 + 2E(p)^2 m_N + E(p)m_N^2 - E(p)p_1^2 - E(p)p_2^2 + 5E(p)p_3^2 + 2m_N p_3^2\right)}{(E(p)(E(p) + m_N))}$$

Operator 167

$$O_3^{A(4,3),1} = O_{1,2,4} + O_{1,4,2} + O_{2,1,4} + O_{2,4,1} + O_{4,1,2} + O_{4,2,1}$$

$$K_3^{A(4,3),1} = \frac{-2p_1 p_2 p_3 (3E(p) + m_N)}{(E(p)(E(p) + m_N))}$$

Operator 168

$$O_4^{A(4,3),1} = O_{1,2,3} + O_{1,3,2} + O_{2,1,3} + O_{2,3,1} + O_{3,1,2} + O_{3,2,1}$$

$$K_4^{A(4,3),1} = \frac{2i p_1 p_2 (E(p)m_N + m_N^2 + 3p_3^2)}{(E(p)(E(p) + m_N))}$$

# (4, 4) Block 1: Trace = 0, Mixed Symmetry, C = mixed

Operator 169

$$O_1^{A(4,4),1} = O_{2,2,1} + O_{3,3,1} + O_{4,4,1}$$

$$K_1^{A(4,4),1} = \frac{-ip_1^3 p_3}{(E(p)(E(p) + m_N))}$$

Operator 170

$$O_2^{A(4,4),1} = O_{1,1,2} + O_{3,3,2} + O_{4,4,2}$$

$$K_2^{A(4,4),1} = \frac{-ip_2^3 p_3}{(E(p)(E(p) + m_N))}$$

Operator 171

$$O_3^{A(4,4),1} = O_{1,1,3} + O_{2,2,3} + O_{4,4,3}$$

$$K_3^{A(4,4),1} = \frac{ip_3^2(-E(p)m_N - m_N^2 - p_3^2)}{(E(p)(E(p) + m_N))}$$

Operator 172

$$O_4^{A(4,4),1} = O_{1,1,4} + O_{2,2,4} + O_{3,3,4}$$

$$K_4^{A(4,4),1} = \frac{-p_3(E(p)^2 + E(p)m_N)}{(E(p) + m_N)}$$

## (4, 4) Block 2: Trace = 0, Mixed Symmetry, C = 1

Operator 173

$$O_1^{A(4,4),2} = O_{1,2,2} + O_{1,3,3} + O_{1,4,4}$$

$$K_1^{A(4,4),2} = \frac{-ip_1 p_3 (m_N^2 + p_1^2)}{(E(p)(E(p) + m_N))}$$

Operator 174

$$O_2^{A(4,4),2} = O_{2,1,1} + O_{2,3,3} + O_{2,4,4}$$

$$K_2^{A(4,4),2} = \frac{-ip_2 p_3 (m_N^2 + p_2^2)}{(E(p)(E(p) + m_N))}$$

Operator 175

$$O_3^{A(4,4),2} = O_{3,1,1} + O_{3,2,2} + O_{3,4,4}$$

$$K_3^{A(4,4),2} = \frac{-i(m_N^2 + p_3^2)(m_N(E(p) + m_N - p_3) + m_N(E(p) + m_N + p_3) + (E(p) - p_3)(E(p) + m_N - p_3) + (E(p) + p_3)}{(4E(p)(E(p) + m_N))}$$

Operator 176

$$O_4^{A(4,4),2} = O_{4,1,1} + O_{4,2,2} + O_{4,3,3}$$

$$K_4^{A(4,4),2} = \frac{-p_3 (p_1^2 + p_2^2 + p_3^2)}{E(p)}$$

# (4, 4) Block 3: Trace = 0, Symmetric, C = 1

Operator 177

$$O_1^{A(4,4),3} = O_{1,1,1}$$

$$K_1^{A(4,4),3} = \frac{ip_1^3 p_3}{(E(p)(E(p) + m_N))}$$

Operator 178

$$O_2^{A(4,4),3} = O_{2,2,2}$$

$$K_2^{A(4,4),3} = \frac{ip_2^3 p_3}{(E(p)(E(p) + m_N))}$$

Operator 179

$$O_3^{A(4,4),3} = O_{3,3,3}$$

$$K_3^{A(4,4),3} = \frac{ip_3^2(E(p)m_N + m_N^2 + p_3^2)}{(E(p)(E(p) + m_N))}$$

Operator 180

$$O_4^{A(4,4),3} = O_{4,4,4}$$

$$K_4^{A(4,4),3} = E(p)p_3$$

# (4, 4) Block 4: Trace = 0, Mixed Symmetry, C = mixed

Operator 181

$$O_1^{A(4,4),4} = O_{2,1,2} + O_{3,1,3} + O_{4,1,4}$$

$$K_1^{A(4,4),4} = \frac{-ip_1^3 p_3}{(E(p)(E(p) + m_N))}$$

Operator 182

$$O_2^{A(4,4),4} = O_{1,2,1} + O_{3,2,3} + O_{4,2,4}$$

$$K_2^{A(4,4),4} = \frac{-ip_2^3 p_3}{(E(p)(E(p) + m_N))}$$

Operator 183

$$O_3^{A(4,4),4} = O_{1,3,1} + O_{2,3,2} + O_{4,3,4}$$

$$K_3^{A(4,4),4} = \frac{ip_3^2(-E(p)m_N - m_N^2 - p_3^2)}{(E(p)(E(p) + m_N))}$$

Operator 184

$$O_4^{A(4,4),4} = O_{1,4,1} + O_{2,4,2} + O_{3,4,3}$$

$$K_4^{A(4,4),4} = \frac{-p_3(E(p)^2 + E(p)m_N)}{(E(p) + m_N)}$$

# (8, 1) Block 1: Trace = 0, Mixed Symmetry, C = mixed

Operator 185

$$O_1^{A(8,1),1} = O_{2,3,4} - O_{2,4,3} - O_{3,4,2} + O_{4,3,2}$$

$$K_1^{A(8,1),1} = \frac{p_2(E(p)^3 + E(p)m_N^2 - E(p)p_1^2 - E(p)p_2^2 - E(p)p_3^2 + 2m_N^3 + 2m_N p_1^2 + 2m_N p_2^2)}{(2E(p)(E(p) + m_N))}$$

Operator 186

$$O_2^{A(8,1),1} = O_{1,3,4} - O_{1,4,3} - O_{3,4,1} + O_{4,3,1}$$

$$K_2^{A(8,1),1} = \frac{p_1(E(p)^3 + E(p)m_N^2 - E(p)p_1^2 - E(p)p_2^2 - E(p)p_3^2 + 2m_N^3 + 2m_N p_1^2 + 2m_N p_2^2)}{(2E(p)(E(p) + m_N))}$$

Operator 187

$$O_3^{A(8,1),1} = O_{1,2,4} - O_{2,1,4} - O_{4,1,2} + O_{4,2,1}$$

$$K_3^{A(8,1),1} = 0$$

Operator 188

$$O_4^{A(8,1),1} = O_{1,2,3} - O_{2,1,3} - O_{3,1,2} + O_{3,2,1}$$

$$K_4^{A(8,1),1} = 0$$

Operator 189

$$O_5^{A(8,1),1} = O_{2,3,4} + O_{2,4,3} - 2O_{3,2,4} + O_{3,4,2} - 2O_{4,2,3} + O_{4,3,2}$$

$$K_5^{A(8,1),1} = \frac{p_2(E(p)^3 + 2E(p)^2 m_N + E(p)m_N^2 - E(p)p_1^2 - E(p)p_2^2 - E(p)p_3^2 + 2m_N p_3^2)}{(2E(p)(E(p) + m_N))}$$

Operator 190

$$O_6^{A(8,1),1} = O_{1,3,4} + O_{1,4,3} - 2O_{3,1,4} + O_{3,4,1} - 2O_{4,1,3} + O_{4,3,1}$$

$$K_6^{A(8,1),1} = \frac{p_1(E(p)^3 + 2E(p)^2 m_N + E(p)m_N^2 - E(p)p_1^2 - E(p)p_2^2 - E(p)p_3^2 + 2m_N p_3^2)}{(2E(p)(E(p) + m_N))}$$

Operator 191

$$O_7^{A(8,1),1} = O_{1,2,4} - 2O_{1,4,2} + O_{2,1,4} - 2O_{2,4,1} + O_{4,1,2} + O_{4,2,1}$$

$$K_7^{A(8,1),1} = \frac{-2m_N p_1 p_2 p_3}{(E(p)(E(p) + m_N))}$$

Operator 192

$$O_8^{A(8,1),1} = O_{1,2,3} - 2O_{1,3,2} + O_{2,1,3} - 2O_{2,3,1} + O_{3,1,2} + O_{3,2,1}$$

$$K_8^{A(8,1),1} = \frac{2im_N p_1 p_2}{E(p)}$$

# (8, 1) Block 2: Trace = 0, Mixed Symmetry, C = mixed

Operator 193

$$O_1^{A(8,1),2} = O_{2,3,4} - O_{2,4,3} + O_{3,2,4} - O_{4,2,3}$$

$$K_1^{A(8,1),2} = \frac{p_2(-E(p)^3 - E(p)m_N^2 + E(p)p_1^2 + E(p)p_2^2 + E(p)p_3^2 - 2m_N^3 - 2m_N p_1^2 - 2m_N p_2^2)}{(2E(p)(E(p) + m_N))}$$

Operator 194

$$O_2^{A(8,1),2} = O_{1,3,4} - O_{1,4,3} + O_{3,1,4} - O_{4,1,3}$$

$$K_2^{A(8,1),2} = \frac{p_1(-E(p)^3 - E(p)m_N^2 + E(p)p_1^2 + E(p)p_2^2 + E(p)p_3^2 - 2m_N^3 - 2m_N p_1^2 - 2m_N p_2^2)}{(2E(p)(E(p) + m_N))}$$

Operator 195

$$O_3^{A(8,1),2} = O_{1,4,2} - O_{2,4,1} + O_{4,1,2} - O_{4,2,1}$$

$$K_3^{A(8,1),2} = 0$$

Operator 196

$$O_4^{A(8,1),2} = O_{1,3,2} - O_{2,3,1} + O_{3,1,2} - O_{3,2,1}$$

$$K_4^{A(8,1),2} = 0$$

Operator 197

$$O_5^{A(8,1),2} = O_{2,3,4} + O_{2,4,3} + O_{3,2,4} - 2O_{3,4,2} + O_{4,2,3} - 2O_{4,3,2}$$

$$K_5^{A(8,1),2} = \frac{p_2(E(p)^3 + 2E(p)^2 m_N + E(p)m_N^2 - E(p)p_1^2 - E(p)p_2^2 - E(p)p_3^2 + 2m_N p_3^2)}{(2E(p)(E(p) + m_N))}$$

Operator 198

$$O_6^{A(8,1),2} = O_{1,3,4} + O_{1,4,3} + O_{3,1,4} - 2O_{3,4,1} + O_{4,1,3} - 2O_{4,3,1}$$

$$K_6^{A(8,1),2} = \frac{p_1(E(p)^3 + 2E(p)^2 m_N + E(p)m_N^2 - E(p)p_1^2 - E(p)p_2^2 - E(p)p_3^2 + 2m_N p_3^2)}{(2E(p)(E(p) + m_N))}$$

Operator 199

$$O_7^{A(8,1),2} = O_{1,2,4} - O_{1,4,2}/2 + O_{2,1,4} - O_{2,4,1}/2 - O_{4,1,2}/2 - O_{4,2,1}/2$$

$$K_7^{A(8,1),2} = \frac{m_N p_1 p_2 p_3}{(E(p)(E(p) + m_N))}$$

Operator 200

$$O_8^{A(8,1),2} = O_{1,2,3} - O_{1,3,2}/2 + O_{2,1,3} - O_{2,3,1}/2 - O_{3,1,2}/2 - O_{3,2,1}/2$$

$$K_8^{A(8,1),2} = \frac{-im_N p_1 p_2}{E(p)}$$

# (8, 2) Block 1: Trace = 0, Mixed Symmetry, C = 1

Operator 201

$$O_1^{A(8,2),1} = O_{1,3,3} - O_{1,4,4}$$

$$K_1^{A(8,2),1} = \frac{ip_1p_3(m_N^2 + p_1^2 + p_2^2 + 2p_3^2)}{(E(p)(E(p) + m_N))}$$

Operator 202

$$O_2^{A(8,2),1} = O_{2,3,3} - O_{2,4,4}$$

$$K_2^{A(8,2),1} = \frac{ip_2p_3(m_N^2 + p_1^2 + p_2^2 + 2p_3^2)}{(E(p)(E(p) + m_N))}$$

Operator 203

$$O_3^{A(8,2),1} = O_{3,1,1} - O_{3,2,2}$$

$$K_3^{A(8,2),1} = \frac{i(p_1^2 - p_2^2)(m_N(E(p) + m_N - p_3) + m_N(E(p) + m_N + p_3) + (E(p) - p_3)(E(p) + m_N - p_3) + (E(p) + p_3)(E(}{(4E(p)(E(p) + m_N))}$$

Operator 204

$$O_4^{A(8,2),1} = O_{4,1,1} - O_{4,2,2}$$

$$K_4^{A(8,2),1} = \frac{p_3(-p_1^2 + p_2^2)}{E(p)}$$

Operator 205

$$O_5^{A(8,2),1} = O_{1,2,2} - O_{1,3,3}/2 - O_{1,4,4}/2$$

$$K_5^{A(8,2),1} = \frac{ip_1p_3(m_N^2 + p_1^2 + 3p_2^2)}{(2E(p)(E(p) + m_N))}$$

Operator 206

$$O_6^{A(8,2),1} = O_{2,1,1} - O_{2,3,3}/2 - O_{2,4,4}/2$$

$$K_6^{A(8,2),1} = \frac{ip_2p_3(m_N^2 + 3p_1^2 + p_2^2)}{(2E(p)(E(p) + m_N))}$$

Operator 207

$$O_7^{A(8,2),1} = O_{3,1,1} + O_{3,2,2} - 2O_{3,4,4}$$

$$K_7^{A(8,2),1} = \frac{i(2m_N^2 + 3p_1^2 + 3p_2^2 + 2p_3^2)(m_N(E(p) + m_N - p_3) + m_N(E(p) + m_N + p_3) + (E(p) - p_3)(E(p) + m_N - p_3) -}{(4E(p)(E(p) + m_N))}$$

Operator 208

$$O_8^{A(8,2),1} = O_{4,1,1} + O_{4,2,2} - 2O_{4,3,3}$$

$$K_8^{A(8,2),1} = \frac{p_3(-p_1^2 - p_2^2 + 2p_3^2)}{E(p)}$$

# (8, 2) Block 2: Trace = 0, Mixed Symmetry, C = mixed

Operator 209

$$O_1^{A(8,2),2} = O_{3,3,1} - O_{4,4,1}$$

$$K_1^{A(8,2),2} = \frac{ip_1 p_3(2E(p)m_N + 2m_N^2 + p_1^2 + p_2^2 + 2p_3^2)}{(E(p)(E(p) + m_N))}$$

Operator 210

$$O_2^{A(8,2),2} = O_{3,3,2} - O_{4,4,2}$$

$$K_2^{A(8,2),2} = \frac{ip_2 p_3(2E(p)m_N + 2m_N^2 + p_1^2 + p_2^2 + 2p_3^2)}{(E(p)(E(p) + m_N))}$$

Operator 211

$$O_3^{A(8,2),2} = O_{1,1,3} - O_{2,2,3}$$

$$K_3^{A(8,2),2} = \frac{ip_3^2(p_1^2 - p_2^2)}{(E(p)(E(p) + m_N))}$$

Operator 212

$$O_4^{A(8,2),2} = O_{1,1,4} - O_{2,2,4}$$

$$K_4^{A(8,2),2} = \frac{p_3(-p_1^2 + p_2^2)}{(E(p) + m_N)}$$

Operator 213

$$O_5^{A(8,2),2} = O_{2,2,1} - O_{3,3,1}/2 - O_{4,4,1}/2$$

$$K_5^{A(8,2),2} = \frac{ip_1 p_3(p_1^2 + 3p_2^2)}{(2E(p)(E(p) + m_N))}$$

Operator 214

$$O_6^{A(8,2),2} = O_{1,1,2} - O_{3,3,2}/2 - O_{4,4,2}/2$$

$$K_6^{A(8,2),2} = \frac{ip_2 p_3(3p_1^2 + p_2^2)}{(2E(p)(E(p) + m_N))}$$

Operator 215

$$O_7^{A(8,2),2} = O_{1,1,3} + O_{2,2,3} - 2O_{4,4,3}$$

$$K_7^{A(8,2),2} = \frac{ip_3^2(2E(p)m_N + 2m_N^2 + 3p_1^2 + 3p_2^2 + 2p_3^2)}{(E(p)(E(p) + m_N))}$$

Operator 216

$$O_8^{A(8,2),2} = O_{1,1,4} + O_{2,2,4} - 2O_{3,3,4}$$

$$K_8^{A(8,2),2} = \frac{p_3(2E(p)m_N + 2m_N^2 - p_1^2 - p_2^2 + 2p_3^2)}{(E(p) + m_N)}$$

# (8, 2) Block 3: Trace = 0, Mixed Symmetry, C = mixed

Operator 217

$$O_1^{A(8,2),3} = O_{3,1,3} - O_{4,1,4}$$

$$K_1^{A(8,2),3} = \frac{ip_1p_3(2E(p)m_N + 2m_N^2 + p_1^2 + p_2^2 + 2p_3^2)}{(E(p)(E(p) + m_N))}$$

Operator 218

$$O_2^{A(8,2),3} = O_{3,2,3} - O_{4,2,4}$$

$$K_2^{A(8,2),3} = \frac{ip_2p_3(2E(p)m_N + 2m_N^2 + p_1^2 + p_2^2 + 2p_3^2)}{(E(p)(E(p) + m_N))}$$

Operator 219

$$O_3^{A(8,2),3} = O_{1,3,1} - O_{2,3,2}$$

$$K_3^{A(8,2),3} = \frac{ip_3^2(p_1^2 - p_2^2)}{(E(p)(E(p) + m_N))}$$

Operator 220

$$O_4^{A(8,2),3} = O_{1,4,1} - O_{2,4,2}$$

$$K_4^{A(8,2),3} = \frac{p_3(-p_1^2 + p_2^2)}{(E(p) + m_N)}$$

Operator 221

$$O_5^{A(8,2),3} = O_{2,1,2} - O_{3,1,3}/2 - O_{4,1,4}/2$$

$$K_5^{A(8,2),3} = \frac{ip_1p_3(p_1^2 + 3p_2^2)}{(2E(p)(E(p) + m_N))}$$

Operator 222

$$O_6^{A(8,2),3} = O_{1,2,1} - O_{3,2,3}/2 - O_{4,2,4}/2$$

$$K_6^{A(8,2),3} = \frac{ip_2p_3(3p_1^2 + p_2^2)}{(2E(p)(E(p) + m_N))}$$

Operator 223

$$O_7^{A(8,2),3} = O_{1,3,1} + O_{2,3,2} - 2O_{4,3,4}$$

$$K_7^{A(8,2),3} = \frac{ip_3^2(2E(p)m_N + 2m_N^2 + 3p_1^2 + 3p_2^2 + 2p_3^2)}{(E(p)(E(p) + m_N))}$$

Operator 224

$$O_8^{A(8,2),3} = O_{1,4,1} + O_{2,4,2} - 2O_{3,4,3}$$

$$K_8^{A(8,2),3} = \frac{p_3(2E(p)m_N + 2m_N^2 - p_1^2 - p_2^2 + 2p_3^2)}{(E(p) + m_N)}$$

# X=T, n=4

## (1, 1) Block 1: Trace = 0, Mixed Symmetry, C = mixed

Operator 225

$$O_1^{T(1,1),1} = O_{1,2,1,2} + O_{1,3,1,3} + O_{1,4,1,4} + O_{2,1,2,1} + O_{2,3,2,3} + O_{2,4,2,4} + O_{3,1,3,1} + O_{3,2,3,2} + O_{3,4,3,4} + O_{4,1,4,1} + O_{4,2}$$

$$K_1^{T(1,1),1} = 0$$

## (1, 1) Block 2: Trace = 0, Mixed Symmetry, C = -1

Operator 226

$$O_1^{T(1,1),2} = O_{1,1,2,2} + O_{1,1,3,3} + O_{1,1,4,4} + O_{2,2,1,1} + O_{2,2,3,3} + O_{2,2,4,4} + O_{3,3,1,1} + O_{3,3,2,2} + O_{3,3,4,4} + O_{4,4,1,1} + O_{4,4}$$

$$K_1^{T(1,1),2} = 0$$

## (1, 1) Block 3: Trace = 0, Symmetric, C = -1

Operator 227

$$O_1^{T(1,1),3} = O_{1,1,1,1} + O_{2,2,2,2} + O_{3,3,3,3} + O_{4,4,4,4}$$

$$K_1^{T(1,1),3} = 0$$

## (1, 1) Block 4: Trace = 0, Mixed Symmetry, C = mixed

Operator 228

$$O_1^{T(1,1),4} = O_{1,2,2,1} + O_{1,3,3,1} + O_{1,4,4,1} + O_{2,1,1,2} + O_{2,3,3,2} + O_{2,4,4,2} + O_{3,1,1,3} + O_{3,2,2,3} + O_{3,4,4,3} + O_{4,1,1,4} + O_{4,2}$$

$$K_1^{T(1,1),4} = 0$$

## (1, 2) Block 1: Trace = 0, Symmetric, C = -1

Operator 229

$$O_1^{T(1,2),1} = O_{1,2,3,4} + O_{1,2,4,3} + O_{1,3,2,4} + O_{1,3,4,2} + O_{1,4,2,3} + O_{1,4,3,2} + O_{2,1,3,4} + O_{2,1,4,3} + O_{2,3,1,4} + O_{2,3,4,1} + O_{2,}$$

$$K_1^{T(1,2),1} = 0$$

## (1, 4) Block 1: Trace = 0, Antisymmetric, C = 1

Operator 230

$$O_1^{T(1,4),1} = O_{1,2,3,4} - O_{1,2,4,3} - O_{1,3,2,4} + O_{1,3,4,2} + O_{1,4,2,3} - O_{1,4,3,2} - O_{2,1,3,4} + O_{2,1,4,3} + O_{2,3,1,4} - O_{2,3,4,1} - O_{2,}$$

$$K_1^{T(1,4),1} = 0$$

## (2, 1) Block 1: Trace = 0, Mixed Symmetry, C = mixed

Operator 231

$$O_1^{T(2,1),1} = O_{1,2,2,1} - O_{1,3,3,1}/2 - O_{1,4,4,1}/2 + O_{2,1,1,2} - O_{2,3,3,2}/2 - O_{2,4,4,2}/2 - O_{3,1,1,3}/2 - O_{3,2,2,3}/2 + O_{3,4,4,3} - O$$

$$K_1^{T(2,1),1} = 0$$

Operator 232

$$O_2^{T(2,1),1} = O_{1,3,3,1} - O_{1,4,4,1} - O_{2,3,3,2} + O_{2,4,4,2} + O_{3,1,1,3} - O_{3,2,2,3} - O_{4,1,1,4} + O_{4,2,2,4}$$

$$K_2^{T(2,1),1} = 0$$

## (2, 1) Block 2: Trace = 0, Mixed Symmetry, C = -1

Operator 233

$$O_1^{T(2,1),2} = O_{1,1,2,2} - O_{1,1,3,3}/2 - O_{1,1,4,4}/2 + O_{2,2,1,1} - O_{2,2,3,3}/2 - O_{2,2,4,4}/2 - O_{3,3,1,1}/2 - O_{3,3,2,2}/2 + O_{3,3,4,4} - $$

$$K_1^{T(2,1),2} = 0$$

Operator 234

$$O_2^{T(2,1),2} = O_{1,1,3,3} - O_{1,1,4,4} - O_{2,2,3,3} + O_{2,2,4,4} + O_{3,3,1,1} - O_{3,3,2,2} - O_{4,4,1,1} + O_{4,4,2,2}$$

$$K_2^{T(2,1),2} = 0$$

## (2, 1) Block 3: Trace = 0, Mixed Symmetry, C = mixed

Operator 235

$$O_1^{T(2,1),3} = O_{1,2,1,2} - O_{1,3,1,3}/2 - O_{1,4,1,4}/2 + O_{2,1,2,1} - O_{2,3,2,3}/2 - O_{2,4,2,4}/2 - O_{3,1,3,1}/2 - O_{3,2,3,2}/2 + O_{3,4,3,4} - $$

$$K_1^{T(2,1),3} = 0$$

Operator 236

$$O_2^{T(2,1),3} = O_{1,3,1,3} - O_{1,4,1,4} - O_{2,3,2,3} + O_{2,4,2,4} + O_{3,1,3,1} - O_{3,2,3,2} - O_{4,1,4,1} + O_{4,2,4,2}$$

$$K_2^{T(2,1),3} = 0$$

## (2, 2) Block 1: Trace = 0, Mixed Symmetry, C = mixed

Operator 237

$$O_1^{T(2,2),1} = O_{1,2,3,4} + O_{1,2,4,3} + O_{1,3,4,2} + O_{2,1,3,4} + O_{2,1,4,3} + O_{2,4,3,1} + O_{3,1,2,4} + O_{3,4,1,2} + O_{3,4,2,1} + O_{4,2,1,3} + O_{4,3}$$
$$K_1^{T(2,2),1} = 0$$

Operator 238

$$O_2^{T(2,2),1} = O_{1,3,2,4} + O_{1,4,2,3} + O_{1,4,3,2} + O_{2,3,1,4} + O_{2,3,4,1} + O_{2,4,1,3} + O_{3,1,4,2} + O_{3,2,1,4} + O_{3,2,4,1} + O_{4,1,2,3} + O_{4,1}$$
$$K_2^{T(2,2),1} = 0$$

## (2, 2) Block 2: Trace = 0, Mixed Symmetry, C = mixed

Operator 239

$$O_1^{T(2,2),2} = O_{1,2,3,4} + O_{1,3,2,4} + O_{1,4,2,3} + O_{2,1,4,3} + O_{2,3,1,4} + O_{2,4,1,3} + O_{3,1,4,2} + O_{3,2,4,1} + O_{3,4,1,2} + O_{4,1,3,2} + O_{4,2}$$
$$K_1^{T(2,2),2} = 0$$

Operator 240

$$O_2^{T(2,2),2} = O_{1,2,4,3} + O_{1,3,4,2} + O_{1,4,3,2} + O_{2,1,3,4} + O_{2,3,4,1} + O_{2,4,3,1} + O_{3,1,2,4} + O_{3,2,1,4} + O_{3,4,2,1} + O_{4,1,2,3} + O_{4,2}$$
$$K_2^{T(2,2),2} = 0$$

## (3, 1) Block 1: Trace = 0, Mixed Symmetry, C = mixed

Operator 241

$$O_1^{T(3,1),1} = O_{1,4,4,1} + O_{2,4,4,2} + O_{3,4,4,3} - O_{4,1,1,4} - O_{4,2,2,4} - O_{4,3,3,4}$$

$$K_1^{T(3,1),1} = 0$$

Operator 242

$$O_2^{T(3,1),1} = O_{1,3,3,1} + 33O_{1,4,4,1}/100 + O_{2,3,3,2} + 33O_{2,4,4,2}/100 - O_{3,1,1,3} - O_{3,2,2,3} - 67O_{3,4,4,3}/100 - 33O_{4,1,1,4}/100$$

$$K_2^{T(3,1),1} = 0$$

Operator 243

$$O_3^{T(3,1),1} = O_{1,2,2,1} + O_{1,3,3,1}/2 + O_{1,4,4,1}/2 - O_{2,1,1,2} - O_{2,3,3,2}/2 - O_{2,4,4,2}/2 - O_{3,1,1,3}/2 + O_{3,2,2,3}/2 - O_{4,1,1,4}/2$$

$$K_3^{T(3,1),1} = 0$$

## (3, 1) Block 2: Trace = 0, Mixed Symmetry, C = -1

Operator 244

$$O_1^{T(3,1),2} = O_{1,1,2,2} + O_{1,1,3,3} - 2O_{1,1,4,4} + O_{2,2,1,1} + O_{2,2,3,3} - 2O_{2,2,4,4} + O_{3,3,1,1} + O_{3,3,2,2} - 2O_{3,3,4,4}$$

$$K_1^{T(3,1),2} = 0$$

Operator 245

$$O_2^{T(3,1),2} = O_{1,1,2,2} - 5O_{1,1,3,3}/4 + O_{1,1,4,4}/4 + O_{2,2,1,1} - 5O_{2,2,3,3}/4 + O_{2,2,4,4}/4 + O_{3,3,1,1}/4 + O_{3,3,2,2}/4 - O_{3,3,4,4}/$$

$$K_2^{T(3,1),2} = 0$$

Operator 246

$$O_3^{T(3,1),2} = O_{1,1,2,2} - O_{1,1,3,3}/2 - O_{1,1,4,4}/2 - O_{2,2,1,1} + O_{2,2,3,3}/2 + O_{2,2,4,4}/2 - 3O_{3,3,1,1}/2 + 3O_{3,3,2,2}/2 - 3O_{4,4,1,1}$$

$$K_3^{T(3,1),2} = 0$$

## (3, 1) Block 3: Trace = 0, Mixed Symmetry, C = -1

Operator 247

$$O_1^{T(3,1),3} = O_{1,1,2,2} + O_{1,1,3,3} + O_{2,2,1,1} + O_{2,2,3,3} + O_{3,3,1,1} + O_{3,3,2,2} - 2O_{4,4,1,1} - 2O_{4,4,2,2} - 2O_{4,4,3,3}$$

$$K_1^{T(3,1),3} = 0$$

Operator 248

$$O_2^{T(3,1),3} = O_{1,1,2,2} + O_{1,1,3,3}/4 + 3O_{1,1,4,4}/4 + O_{2,2,1,1} + O_{2,2,3,3}/4 + 3O_{2,2,4,4}/4 - 5O_{3,3,1,1}/4 - 5O_{3,3,2,2}/4 - 3O_{3,3,4}$$

$$K_2^{T(3,1),3} = 0$$

Operator 249

$$O_3^{T(3,1),3} = O_{1,1,2,2} + 3O_{1,1,3,3}/2 + 3O_{1,1,4,4}/2 - O_{2,2,1,1} - 3O_{2,2,3,3}/2 - 3O_{2,2,4,4}/2 + O_{3,3,1,1}/2 - O_{3,3,2,2}/2 + O_{4,4,1,}$$

$$K_3^{T(3,1),3} = 0$$

## (3, 1) Block 4: Trace = 0, Mixed Symmetry, C = -1

Operator 250

$$O_1^{T(3,1),4} = O_{1,1,4,4} + O_{2,2,4,4} + O_{3,3,4,4} - O_{4,4,1,1} - O_{4,4,2,2} - O_{4,4,3,3}$$

$$K_1^{T(3,1),4} = 0$$

Operator 251

$$O_2^{T(3,1),4} = O_{1,1,3,3} + 33O_{1,1,4,4}/100 + O_{2,2,3,3} + 33O_{2,2,4,4}/100 - O_{3,3,1,1} - O_{3,3,2,2} - 67O_{3,3,4,4}/100 - 33O_{4,4,1,1}/100$$

$$K_2^{T(3,1),4} = 0$$

Operator 252

$$O_3^{T(3,1),4} = O_{1,1,2,2} + O_{1,1,3,3}/2 + O_{1,1,4,4}/2 - O_{2,2,1,1} - O_{2,2,3,3}/2 - O_{2,2,4,4}/2 - O_{3,3,1,1}/2 + O_{3,3,2,2}/2 - O_{4,4,1,1}/2$$

$$K_3^{T(3,1),4} = 0$$

## (3, 1) Block 5: Trace = 0, Mixed Symmetry, C = mixed

Operator 253

$$O_1^{T(3,1),5} = O_{1,4,1,4} + O_{2,4,2,4} + O_{3,4,3,4} - O_{4,1,4,1} - O_{4,2,4,2} - O_{4,3,4,3}$$

$$K_1^{T(3,1),5} = 0$$

Operator 254

$$O_2^{T(3,1),5} = O_{1,3,1,3} + 33O_{1,4,1,4}/100 + O_{2,3,2,3} + 33O_{2,4,2,4}/100 - O_{3,1,3,1} - O_{3,2,3,2} - 67O_{3,4,3,4}/100 - 33O_{4,1,4,1}/100$$

$$K_2^{T(3,1),5} = 0$$

Operator 255

$$O_3^{T(3,1),5} = O_{1,2,1,2} + O_{1,3,1,3}/2 + O_{1,4,1,4}/2 - O_{2,1,2,1} - O_{2,3,2,3}/2 - O_{2,4,2,4}/2 - O_{3,1,3,1}/2 + O_{3,2,3,2}/2 - O_{4,1,4,1}/2$$

$$K_3^{T(3,1),5} = 0$$

# (3, 1) Block 6: Trace = 0, Mixed Symmetry, C = mixed

Operator 256

$$O_1^{T(3,1),6} = O_{1,2,1,2} + O_{1,3,1,3} + O_{2,1,2,1} + O_{2,3,2,3} + O_{3,1,3,1} + O_{3,2,3,2} - 2O_{4,1,4,1} - 2O_{4,2,4,2} - 2O_{4,3,4,3}$$

$$K_1^{T(3,1),6} = 0$$

Operator 257

$$O_2^{T(3,1),6} = O_{1,2,1,2} + O_{1,3,1,3}/4 + 3O_{1,4,1,4}/4 + O_{2,1,2,1} + O_{2,3,2,3}/4 + 3O_{2,4,2,4}/4 - 5O_{3,1,3,1}/4 - 5O_{3,2,3,2}/4 - 3O_{3,4,}$$

$$K_2^{T(3,1),6} = 0$$

Operator 258

$$O_3^{T(3,1),6} = O_{1,2,1,2} + 3O_{1,3,1,3}/2 + 3O_{1,4,1,4}/2 - O_{2,1,2,1} - 3O_{2,3,2,3}/2 - 3O_{2,4,2,4}/2 + O_{3,1,3,1}/2 - O_{3,2,3,2}/2 + O_{4,1,4,}$$

$$K_3^{T(3,1),6} = 0$$

## (3, 1) Block 7: Trace = 0, Symmetric, C = -1

Operator 259

$$O_1^{T(3,1),7} = O_{1,1,1,1} + O_{2,2,2,2} + O_{3,3,3,3} - 3O_{4,4,4,4}$$

$$K_1^{T(3,1),7} = 0$$

Operator 260

$$O_2^{T(3,1),7} = O_{1,1,1,1} + O_{2,2,2,2} - 2O_{3,3,3,3}$$

$$K_2^{T(3,1),7} = 0$$

Operator 261

$$O_3^{T(3,1),7} = O_{1,1,1,1} - O_{2,2,2,2}$$

$$K_3^{T(3,1),7} = 0$$

# (3, 2) Block 1: Trace = 0, Mixed Symmetry, C = mixed

Operator 262

$$O_1^{T(3,2),1} = O_{1,2,3,4} + O_{1,3,2,4} + O_{2,1,3,4} + O_{2,3,1,4} + O_{3,1,2,4} + O_{3,2,1,4} - O_{4,1,2,3} - O_{4,1,3,2} - O_{4,2,1,3} - O_{4,2,3,1} - O_{4,3}$$

$$K_1^{T(3,2),1} = \frac{4p_3(p_1^2 - p_2^2)}{E(p)}$$

Operator 263

$$O_2^{T(3,2),1} = O_{1,2,3,4} + 3O_{1,2,4,3} + O_{1,3,2,4} + 3O_{1,4,2,3} + O_{2,1,3,4} + 3O_{2,1,4,3} + O_{2,3,1,4} + 3O_{2,4,1,3} - 2O_{3,1,2,4} - 3O_{3,1,4,2}$$

$$K_2^{T(3,2),1} = \frac{4p_3(4E(p)p_1^2 - 4E(p)p_2^2 + m_N p_1^2 - m_N p_2^2)}{(E(p)(E(p) + m_N))}$$

Operator 264

$$O_3^{T(3,2),1} = O_{1,2,3,4} + O_{1,2,4,3} + O_{1,3,2,4} + 2O_{1,3,4,2} + O_{1,4,2,3} + 2O_{1,4,3,2} - O_{2,1,3,4} - O_{2,1,4,3} - O_{2,3,1,4} - 2O_{2,3,4,1} - 0$$

$$K_3^{T(3,2),1} = \frac{4p_3(-E(p)^3 - E(p)m_N^2 - 3E(p)p_1^2 - 3E(p)p_2^2 + E(p)p_3^2 - 2m_N^3 - 3m_N p_1^2 - 3m_N p_2^2 - 2m_N p_3^2)}{(E(p)(E(p) + m_N))}$$

# (3, 2) Block 2: Trace = 0, Mixed Symmetry, C = 1

Operator 265

$$O_1^{T(3,2),2} = O_{1,2,3,4} - O_{1,2,4,3} + O_{1,3,2,4} - O_{1,3,4,2} + O_{2,1,3,4} - O_{2,1,4,3} + O_{2,3,1,4} - O_{2,3,4,1} + O_{3,1,2,4} - O_{3,1,4,2} + O_{3,2}$$

$$K_1^{T(3,2),2} = 0$$

Operator 266

$$O_2^{T(3,2),2} = O_{1,2,3,4} - O_{1,2,4,3} - O_{1,3,2,4}/2 + O_{1,3,4,2}/2 - 3O_{1,4,2,3}/2 + 3O_{1,4,3,2}/2 + O_{2,1,3,4} - O_{2,1,4,3} - O_{2,3,1,4}/2 + O$$

$$K_2^{T(3,2),2} = 0$$

Operator 267

$$O_3^{T(3,2),2} = -O_{1,3,2,4}/2 + O_{1,3,4,2}/2 - O_{1,4,2,3}/2 + O_{1,4,3,2}/2 + O_{2,3,1,4}/2 - O_{2,3,4,1}/2 + O_{2,4,1,3}/2 - O_{2,4,3,1}/2 - O_{3,1}$$

$$K_3^{T(3,2),2} = 0$$

# (3, 2) Block 3: Trace = 0, Mixed Symmetry, C = mixed

Operator 268

$$O_1^{T(3,2),3} = O_{1,2,3,4} + O_{1,3,2,4} - O_{1,4,2,3} - O_{1,4,3,2} + O_{2,1,3,4} + O_{2,3,1,4} - O_{2,4,1,3} - O_{2,4,3,1} + O_{3,1,2,4} + O_{3,2,1,4} - O_{3,4}$$

$$K_1^{T(3,2),3} = \frac{4p_3(-p_1^2 + p_2^2)}{E(p)}$$

Operator 269

$$O_2^{T(3,2),3} = O_{1,2,3,4} + 3O_{1,2,4,3} - 2O_{1,3,2,4} - 3O_{1,3,4,2} + 2O_{1,4,2,3} - O_{1,4,3,2} + O_{2,1,3,4} + 3O_{2,1,4,3} - 2O_{2,3,1,4} - 3O_{2,3,4}$$

$$K_2^{T(3,2),3} = \frac{4p_3(-4E(p)p_1^2 + 4E(p)p_2^2 - m_N p_1^2 + m_N p_2^2)}{(E(p)(E(p) + m_N))}$$

Operator 270

$$O_3^{T(3,2),3} = O_{1,2,3,4} + O_{1,2,4,3} - O_{1,3,4,2} - O_{1,4,3,2} - O_{2,1,3,4} - O_{2,1,4,3} + O_{2,3,4,1} + O_{2,4,3,1} - O_{3,1,2,4} - 2O_{3,1,4,2} + O_3$$

$$K_3^{T(3,2),3} = \frac{4p_3(-E(p)^3 - E(p)m_N^2 - 3E(p)p_1^2 - 3E(p)p_2^2 + E(p)p_3^2 - 2m_N^3 - 3m_N p_1^2 - 3m_N p_2^2 - 2m_N p_3^2)}{(E(p)(E(p) + m_N))}$$

## (3, 3) Block 1: Trace = 0, Mixed Symmetry, C = mixed

Operator 271

$$O_1^{T(3,3),1} = O_{1,2,2,1} - O_{1,3,3,1} - O_{2,1,1,2} + O_{2,3,3,2} + O_{3,1,1,3} - O_{3,2,2,3}$$

$$K_1^{T(3,3),1} = \frac{4ip_1p_2(E(p)m_N + m_N^2 + p_1^2 + p_2^2 - 2p_3^2)}{(E(p)(E(p) + m_N))}$$

Operator 272

$$O_2^{T(3,3),1} = O_{1,2,2,1} + O_{1,3,3,1}/2 - 3O_{1,4,4,1}/2 - O_{2,1,1,2} - O_{2,3,3,2}/2 + 3O_{2,4,4,2}/2 - O_{3,1,1,3}/2 + O_{3,2,2,3}/2 + 3O_{4,1,1,4}$$

$$K_2^{T(3,3),1} = \frac{16ip_1p_2(E(p)^2 + E(p)m_N)}{(E(p)(E(p) + m_N))}$$

Operator 273

$$O_3^{T(3,3),1} = O_{1,3,3,1} - O_{1,4,4,1} + O_{2,3,3,2} - O_{2,4,4,2} - O_{3,1,1,3} - O_{3,2,2,3} + 2O_{3,4,4,3} + O_{4,1,1,4} + O_{4,2,2,4} - 2O_{4,3,3,4}$$

$$K_3^{T(3,3),1} = 0$$

# (3, 3) Block 2: Trace = 0, Mixed Symmetry, C = mixed

Operator 274

$$O_1^{T(3,3),2} = O_{1,2,1,2} - O_{1,3,1,3} - O_{2,1,2,1} + O_{2,3,2,3} + O_{3,1,3,1} - O_{3,2,3,2}$$

$$K_1^{T(3,3),2} = \frac{4ip_1p_2(E(p)m_N + m_N^2 + p_1^2 + p_2^2 - 2p_3^2)}{(E(p)(E(p) + m_N))}$$

Operator 275

$$O_2^{T(3,3),2} = O_{1,2,1,2} + O_{1,3,1,3}/2 - 3O_{1,4,1,4}/2 - O_{2,1,2,1} - O_{2,3,2,3}/2 + 3O_{2,4,2,4}/2 - O_{3,1,3,1}/2 + O_{3,2,3,2}/2 + 3O_{4,1,4,1}$$

$$K_2^{T(3,3),2} = \frac{16ip_1p_2(E(p)^2 + E(p)m_N)}{(E(p)(E(p) + m_N))}$$

Operator 276

$$O_3^{T(3,3),2} = O_{1,3,1,3} - O_{1,4,1,4} + O_{2,3,2,3} - O_{2,4,2,4} - O_{3,1,3,1} - O_{3,2,3,2} + 2O_{3,4,3,4} + O_{4,1,4,1} + O_{4,2,4,2} - 2O_{4,3,4,3}$$

$$K_3^{T(3,3),2} = 0$$

## (3, 3) Block 3: Trace = 0, Mixed Symmetry, C = -1

Operator 277

$$O_1^{T(3,3),3} = O_{1,1,2,2} - O_{1,1,3,3} - O_{2,2,1,1} + O_{2,2,3,3} + O_{3,3,1,1} - O_{3,3,2,2}$$

$$K_1^{T(3,3),3} = 0$$

Operator 278

$$O_2^{T(3,3),3} = O_{1,1,2,2} + O_{1,1,3,3}/2 - 3O_{1,1,4,4}/2 - O_{2,2,1,1} - O_{2,2,3,3}/2 + 3O_{2,2,4,4}/2 - O_{3,3,1,1}/2 + O_{3,3,2,2}/2 + 3O_{4,4,1,1}$$

$$K_2^{T(3,3),3} = 0$$

Operator 279

$$O_3^{T(3,3),3} = O_{1,1,3,3} - O_{1,1,4,4} + O_{2,2,3,3} - O_{2,2,4,4} - O_{3,3,1,1} - O_{3,3,2,2} + 2O_{3,3,4,4} + O_{4,4,1,1} + O_{4,4,2,2} - 2O_{4,4,3,3}$$

$$K_3^{T(3,3),3} = 0$$

# (3, 4) Block 1: Trace = 0, Mixed Symmetry, C = mixed

Operator 280

$$O_1^{T(3,4),1} = O_{1,2,3,4} - O_{1,3,2,4} - O_{1,4,2,3} + O_{1,4,3,2} - O_{2,1,3,4} + O_{2,3,1,4} + O_{2,4,1,3} - O_{2,4,3,1} + O_{3,1,2,4} - O_{3,2,1,4} - O_{3,4}$$

$$K_1^{T(3,4),1} = -4m_N p_3$$

Operator 281

$$O_2^{T(3,4),1} = O_{1,2,3,4} - 3O_{1,2,4,3} + 2O_{1,3,2,4} - 3O_{1,3,4,2} + 2O_{1,4,2,3} + O_{1,4,3,2} - O_{2,1,3,4} + 3O_{2,1,4,3} - 2O_{2,3,1,4} + 3O_{2,3,4}$$

$$K_2^{T(3,4),1} = \frac{4p_3(E(p)^3 + E(p)m_N^2 - E(p)p_1^2 - E(p)p_2^2 - E(p)p_3^2 + 2m_N^3 - m_N p_1^2 - m_N p_2^2 + 2m_N p_3^2)}{(E(p)(E(p) + m_N))}$$

Operator 282

$$O_3^{T(3,4),1} = O_{1,2,3,4} - O_{1,2,4,3} - O_{1,3,4,2} + O_{1,4,3,2} + O_{2,1,3,4} - O_{2,1,4,3} - O_{2,3,4,1} + O_{2,4,3,1} - O_{3,1,2,4} + 2O_{3,1,4,2} - O_3$$

$$K_3^{T(3,4),1} = \frac{4m_N p_3(p_1^2 - p_2^2)}{(E(p)(E(p) + m_N))}$$

# (3, 4) Block 2: Trace = 0, Mixed Symmetry, C = -1

Operator 283

$$O_1^{T(3,4),2} = O_{1,2,3,4} + O_{1,2,4,3} - O_{1,3,2,4} - O_{1,3,4,2} - O_{2,1,3,4} - O_{2,1,4,3} + O_{2,3,1,4} + O_{2,3,4,1} + O_{3,1,2,4} + O_{3,1,4,2} - O_{3,2,\ldots}$$

$$K_1^{T(3,4),2} = -8m_N p_3$$

Operator 284

$$O_2^{T(3,4),2} = O_{1,2,3,4} + O_{1,2,4,3} + O_{1,3,2,4}/2 + O_{1,3,4,2}/2 - 3O_{1,4,2,3}/2 - 3O_{1,4,3,2}/2 - O_{2,1,3,4} - O_{2,1,4,3} - O_{2,3,1,4}/2 - \ldots$$

$$K_2^{T(3,4),2} = \frac{4p_3(-E(p)^3 - E(p)m_N^2 + E(p)p_1^2 + E(p)p_2^2 + E(p)p_3^2 - 2m_N^3 + m_N p_1^2 + m_N p_2^2 - 2m_N p_3^2)}{(E(p)(E(p) + m_N))}$$

Operator 285

$$O_3^{T(3,4),2} = O_{1,3,2,4}/2 + O_{1,3,4,2}/2 - O_{1,4,2,3}/2 - O_{1,4,3,2}/2 + O_{2,3,1,4}/2 + O_{2,3,4,1}/2 - O_{2,4,1,3}/2 - O_{2,4,3,1}/2 - O_{3,1,2,\ldots}$$

$$K_3^{T(3,4),2} = \frac{4m_N p_3(-p_1^2 + p_2^2)}{(E(p)(E(p) + m_N))}$$

## (3, 4) Block 3: Trace = 0, Mixed Symmetry, C = mixed

Operator 286

$$O_1^{T(3,4),3} = O_{1,2,3,4} - O_{1,3,2,4} - O_{2,1,3,4} + O_{2,3,1,4} + O_{3,1,2,4} - O_{3,2,1,4} + O_{4,1,2,3} - O_{4,1,3,2} - O_{4,2,1,3} + O_{4,2,3,1} + O_{4,3,}$$

$$K_1^{T(3,4),3} = -4m_N p_3$$

Operator 287

$$O_2^{T(3,4),3} = O_{1,2,3,4} - 3O_{1,2,4,3} - O_{1,3,2,4} + 3O_{1,4,2,3} - O_{2,1,3,4} + 3O_{2,1,4,3} + O_{2,3,1,4} - 3O_{2,4,1,3} - 2O_{3,1,2,4} + 3O_{3,1,4,2}$$

$$K_2^{T(3,4),3} = \frac{4p_3(E(p)^3 + E(p)m_N^2 - E(p)p_1^2 - E(p)p_2^2 - E(p)p_3^2 + 2m_N^3 - m_N p_1^2 - m_N p_2^2 + 2m_N p_3^2)}{(E(p)(E(p) + m_N))}$$

Operator 288

$$O_3^{T(3,4),3} = O_{1,2,3,4} - O_{1,2,4,3} - O_{1,3,2,4} + 2O_{1,3,4,2} + O_{1,4,2,3} - 2O_{1,4,3,2} + O_{2,1,3,4} - O_{2,1,4,3} - O_{2,3,1,4} + 2O_{2,3,4,1} + O_{2,3,4,1}$$

$$K_3^{T(3,4),3} = \frac{4m_N p_3(-p_1^2 + p_2^2)}{(E(p)(E(p) + m_N))}$$

# (6, 1) Block 1: Trace = 0, Mixed Symmetry, C = mixed

Operator 289

$$O_1^{T(6,1),1} = O_{1,1,2,1} - O_{2,2,1,2}$$

$$K_1^{T(6,1),1} = 0$$

Operator 290

$$O_2^{T(6,1),1} = O_{1,1,3,1} - O_{3,3,1,3}$$

$$K_2^{T(6,1),1} = 0$$

Operator 291

$$O_3^{T(6,1),1} = O_{2,2,3,2} - O_{3,3,2,3}$$

$$K_3^{T(6,1),1} = 0$$

Operator 292

$$O_4^{T(6,1),1} = O_{1,1,4,1} - O_{4,4,1,4}$$

$$K_4^{T(6,1),1} = 0$$

Operator 293

$$O_5^{T(6,1),1} = O_{2,2,4,2} - O_{4,4,2,4}$$

$$K_5^{T(6,1),1} = 0$$

Operator 294

$$O_6^{T(6,1),1} = O_{3,3,4,3} - O_{4,4,3,4}$$

$$K_6^{T(6,1),1} = 0$$

# (6, 1) Block 2: Trace = 0, Mixed Symmetry, C = -1

Operator 295

$$O_1^{T(6,1),2} = O_{1,2,1,1} - O_{2,1,2,2}$$

$$K_1^{T(6,1),2} = \frac{i(p_1^2 + p_2^2)(m_N(E(p) + m_N - p_3) + m_N(E(p) + m_N + p_3) + (E(p) - p_3)(E(p) + m_N + p_3) + (E(p) + p_3)(E(}{(2E(p)(E(p) + m_N))}$$

Operator 296

$$O_2^{T(6,1),2} = O_{1,3,1,1} - O_{3,1,3,3}$$

$$K_2^{T(6,1),2} = \frac{2ip_2p_3(p_1^2 + p_3^2)}{(E(p)(E(p) + m_N))}$$

Operator 297

$$O_3^{T(6,1),2} = O_{2,3,2,2} - O_{3,2,3,3}$$

$$K_3^{T(6,1),2} = \frac{-2ip_1p_3(p_2^2 + p_3^2)}{(E(p)(E(p) + m_N))}$$

Operator 298

$$O_4^{T(6,1),2} = O_{1,4,1,1} - O_{4,1,4,4}$$

$$K_4^{T(6,1),2} = \frac{2p_2(m_N^2 + p_2^2 + p_3^2)}{E(p)}$$

Operator 299

$$O_5^{T(6,1),2} = O_{2,4,2,2} - O_{4,2,4,4}$$

$$K_5^{T(6,1),2} = \frac{-2p_1(m_N^2 + p_1^2 + p_3^2)}{E(p)}$$

Operator 300

$$O_6^{T(6,1),2} = O_{3,4,3,3} - O_{4,3,4,4}$$

$$K_6^{T(6,1),2} = 0$$

# (6, 1) Block 3: Trace = 0, Mixed Symmetry, C = mixed

Operator 301

$$O_1^{T(6,1),3} = O_{1,1,1,2} + O_{1,1,1,3}/2 - O_{2,2,2,1}$$

$$K_1^{T(6,1),3} = 0$$

Operator 302

$$O_2^{T(6,1),3} = O_{1,1,1,2} + 14O_{1,1,1,3} + 9O_{1,1,1,4} + 8O_{2,2,2,1} - 18O_{3,3,3,1} - 9O_{3,3,3,2} - 9O_{3,3,3,4}$$

$$K_2^{T(6,1),3} = 0$$

Operator 303

$$O_3^{T(6,1),3} = O_{1,1,1,2} - 23O_{1,1,1,3}/25 - 19O_{1,1,1,4}/20 + 27O_{2,2,2,1}/50 + 497O_{2,2,2,3}/100 + 249O_{2,2,2,4}/100 + 189O_{3,3,3,1}/$$

$$K_3^{T(6,1),3} = 0$$

Operator 304

$$O_4^{T(6,1),3} = O_{1,1,1,2} - 207O_{1,1,1,3}/50 + 1679O_{1,1,1,4}/100 - 107O_{2,2,2,1}/100 - 389O_{2,2,2,3}/100 + 151O_{2,2,2,4}/50 + 619O_3,$$

$$K_4^{T(6,1),3} = 0$$

Operator 305

$$O_5^{T(6,1),3} = O_{1,1,1,2} - 167O_{1,1,1,3}/100 + 159O_{1,1,1,4}/50 + 17O_{2,2,2,1}/100 - 71O_{2,2,2,3}/50 - 121O_{2,2,2,4}/20 + 289O_{3,3,3,1},$$

$$K_5^{T(6,1),3} = 0$$

Operator 306

$$O_6^{T(6,1),3} = O_{1,1,1,2} + 57O_{1,1,1,3}/100 + 11O_{1,1,1,4}/100 + 129O_{2,2,2,1}/100 + 59O_{2,2,2,3}/100 - 23O_{2,2,2,4}/100 + 21O_{3,3,3,1},$$

$$K_6^{T(6,1),3} = 0$$

## (6, 1) Block 4: Trace = 0, Mixed Symmetry, C = mixed

Operator 307

$$O_1^{T(6,1),4} = O_{1,1,1,2} - O_{2,2,2,1} - O_{3,3,3,2}/2$$

$$K_1^{T(6,1),4} = 0$$

Operator 308

$$O_2^{T(6,1),4} = O_{1,1,1,3} - O_{3,3,3,1}$$

$$K_2^{T(6,1),4} = 0$$

Operator 309

$$O_3^{T(6,1),4} = O_{1,1,1,2} - O_{2,2,2,1} - 9O_{2,2,2,3}/2 + 4O_{3,3,3,2}$$

$$K_3^{T(6,1),4} = 0$$

Operator 310

$$O_4^{T(6,1),4} = O_{1,1,1,2} + 17O_{1,1,1,4}/5 + 7O_{2,2,2,1}/10 + 3O_{2,2,2,3}/5 + 3O_{3,3,3,2}/5 - 17O_{4,4,4,1}/5$$

$$K_4^{T(6,1),4} = 0$$

Operator 311

$$O_5^{T(6,1),4} = O_{1,1,1,2} - 27O_{1,1,1,4}/100 + 9O_{2,2,2,1}/10 + 19O_{2,2,2,3}/100 + 102O_{2,2,2,4}/25 + 19O_{3,3,3,2}/100 + 27O_{4,4,4,1}/100$$

$$K_5^{T(6,1),4} = 0$$

Operator 312

$$O_6^{T(6,1),4} = O_{1,1,1,2} - 29O_{1,1,1,4}/100 + 83O_{2,2,2,1}/100 + 7O_{2,2,2,3}/20 - O_{2,2,2,4}/4 + 7O_{3,3,3,2}/20 - 14O_{3,3,3,4}/5 + 29O_{4,}$$

$$K_6^{T(6,1),4} = 0$$

# (6, 1) Block 5: Trace = 0, Mixed Symmetry, C = mixed

Operator 313

$$O_1^{T(6,1),5} = O_{1,1,1,2} - O_{2,2,2,1} + O_{2,2,2,3}/2$$

$$K_1^{T(6,1),5} = 0$$

Operator 314

$$O_2^{T(6,1),5} = O_{1,1,1,2} + 18O_{1,1,1,3}/5 + 4O_{2,2,2,1}/5 - 2O_{2,2,2,3}/5 - 18O_{3,3,3,1}/5 - 9O_{3,3,3,4}/5$$

$$K_2^{T(6,1),5} = 0$$

Operator 315

$$O_3^{T(6,1),5} = O_{1,1,1,2} + 18O_{1,1,1,3}/5 - 82O_{2,2,2,1}/5 - 174O_{2,2,2,3}/5 - 18O_{3,3,3,1}/5 + 172O_{3,3,3,2}/5 + 77O_{3,3,3,4}/5$$

$$K_3^{T(6,1),5} = 0$$

Operator 316

$$O_4^{T(6,1),5} = O_{1,1,1,2} - 9O_{1,1,1,3}/100 - 307O_{1,1,1,4}/50 + 71O_{2,2,2,1}/50 + 21O_{2,2,2,3}/25 + 9O_{3,3,3,1}/100 + 61O_{3,3,3,2}/50 +$$

$$K_4^{T(6,1),5} = 0$$

Operator 317

$$O_5^{T(6,1),5} = O_{1,1,1,2} - 29O_{1,1,1,3}/100 + 19O_{1,1,1,4}/20 + 53O_{2,2,2,1}/100 - 93O_{2,2,2,3}/100 - 371O_{2,2,2,4}/100 + 29O_{3,3,3,1}/$$

$$K_5^{T(6,1),5} = 0$$

Operator 318

$$O_6^{T(6,1),5} = O_{1,1,1,2} + 47O_{1,1,1,3}/100 + 21O_{1,1,1,4}/50 + 34O_{2,2,2,1}/25 + 73O_{2,2,2,3}/100 + O_{2,2,2,4}/20 - 47O_{3,3,3,1}/100 -$$

$$K_6^{T(6,1),5} = 0$$

# (6, 1) Block 6: Trace = 0, Mixed Symmetry, C = -1

Operator 319

$$O_1^{T(6,1),6} = O_{1,2,2,2} - O_{2,1,1,1}$$

$$K_1^{T(6,1),6} = \frac{i(p_1^2 + p_2^2)(m_N(E(p) + m_N - p_3) + m_N(E(p) + m_N + p_3) + (E(p) - p_3)(E(p) + m_N + p_3) + (E(p) + p_3)(E(}{(2E(p)(E(p) + m_N))}$$

Operator 320

$$O_2^{T(6,1),6} = O_{1,3,3,3} - O_{3,1,1,1}$$

$$K_2^{T(6,1),6} = \frac{2ip_2p_3(p_1^2 + p_3^2)}{(E(p)(E(p) + m_N))}$$

Operator 321

$$O_3^{T(6,1),6} = O_{2,3,3,3} - O_{3,2,2,2}$$

$$K_3^{T(6,1),6} = \frac{-2ip_1p_3(p_2^2 + p_3^2)}{(E(p)(E(p) + m_N))}$$

Operator 322

$$O_4^{T(6,1),6} = O_{1,4,4,4} - O_{4,1,1,1}$$

$$K_4^{T(6,1),6} = \frac{2p_2(m_N^2 + p_2^2 + p_3^2)}{E(p)}$$

Operator 323

$$O_5^{T(6,1),6} = O_{2,4,4,4} - O_{4,2,2,2}$$

$$K_5^{T(6,1),6} = \frac{-2p_1(m_N^2 + p_1^2 + p_3^2)}{E(p)}$$

Operator 324

$$O_6^{T(6,1),6} = O_{3,4,4,4} - O_{4,3,3,3}$$

$$K_6^{T(6,1),6} = 0$$

## (6, 1) Block 7: Trace = 0, Mixed Symmetry, C = mixed

Operator 325

$$O_1^{T(6,1),7} = O_{1,1,2,1} - O_{2,2,1,2} - O_{3,3,2,3}/2$$
$$K_1^{T(6,1),7} = 0$$

Operator 326

$$O_2^{T(6,1),7} = O_{1,1,3,1} - O_{3,3,1,3}$$
$$K_2^{T(6,1),7} = 0$$

Operator 327

$$O_3^{T(6,1),7} = O_{1,1,2,1} - O_{2,2,1,2} - 9O_{2,2,3,2}/2 + 4O_{3,3,2,3}$$
$$K_3^{T(6,1),7} = 0$$

Operator 328

$$O_4^{T(6,1),7} = O_{1,1,2,1} + 17O_{1,1,4,1}/5 + 7O_{2,2,1,2}/10 + 3O_{2,2,3,2}/5 + 3O_{3,3,2,3}/5 - 17O_{4,4,1,4}/5$$
$$K_4^{T(6,1),7} = 0$$

Operator 329

$$O_5^{T(6,1),7} = O_{1,1,2,1} - 27O_{1,1,4,1}/100 + 9O_{2,2,1,2}/10 + 19O_{2,2,3,2}/100 + 102O_{2,2,4,2}/25 + 19O_{3,3,2,3}/100 + 27O_{4,4,1,4}/10$$
$$K_5^{T(6,1),7} = 0$$

Operator 330

$$O_6^{T(6,1),7} = O_{1,1,2,1} - 29O_{1,1,4,1}/100 + 83O_{2,2,1,2}/100 + 7O_{2,2,3,2}/20 - O_{2,2,4,2}/4 + 7O_{3,3,2,3}/20 - 14O_{3,3,4,3}/5 + 29O_4,$$
$$K_6^{T(6,1),7} = 0$$

## (6, 1) Block 8: Trace = 0, Mixed Symmetry, C = mixed

Operator 331

$$O_1^{T(6,1),8} = O_{1,1,1,2} - O_{2,2,2,1} - O_{3,3,3,1}/2$$

$$K_1^{T(6,1),8} = 0$$

Operator 332

$$O_2^{T(6,1),8} = O_{1,1,1,2} - 9O_{1,1,1,3}/4 + 13O_{2,2,2,1}/100 - 28O_{2,2,2,3}/25 + 7O_{3,3,3,1}/4 + 28O_{4,4,4,1}/25 - 28O_{4,4,4,3}/25$$

$$K_2^{T(6,1),8} = 0$$

Operator 333

$$O_3^{T(6,1),8} = O_{1,1,1,2} + 7O_{1,1,1,3}/2 + 37O_{2,2,2,1}/20 - 149O_{2,2,2,3}/20 - 17O_{3,3,3,1}/10 + 46O_{3,3,3,2}/5 - 7O_{4,4,4,1}/4 + 23O_{4,}$$

$$K_3^{T(6,1),8} = 0$$

Operator 334

$$O_4^{T(6,1),8} = O_{1,1,1,2} - 289O_{1,1,1,3}/50 + 464O_{1,1,1,4}/25 - 93O_{2,2,2,1}/100 + 69O_{2,2,2,3}/25 + 232O_{2,2,2,4}/25 + 387O_{3,3,3,1}/$$

$$K_4^{T(6,1),8} = 0$$

Operator 335

$$O_5^{T(6,1),8} = O_{1,1,1,2} + 873O_{1,1,1,3}/50 - 89O_{1,1,1,4}/50 + 151O_{2,2,2,1}/25 - 2281O_{2,2,2,3}/100 + 3833O_{2,2,2,4}/100 - 252O_{3,3}$$

$$K_5^{T(6,1),8} = 0$$

Operator 336

$$O_6^{T(6,1),8} = O_{1,1,1,2} + 17O_{1,1,1,3}/100 + 31O_{1,1,1,4}/100 + 39O_{2,2,2,1}/50 + 8O_{2,2,2,3}/25 + 69O_{2,2,2,4}/100 + 11O_{3,3,3,1}/25 +$$

$$K_6^{T(6,1),8} = 0$$

# (6, 1) Block 9: Trace = 0, Mixed Symmetry, C = mixed

Operator 337

$$O_1^{T(6,1),9} = O_{1,1,1,2} - O_{2,2,2,1}$$
$$K_1^{T(6,1),9} = 0$$

Operator 338

$$O_2^{T(6,1),9} = O_{1,1,1,3} - O_{3,3,3,1}$$
$$K_2^{T(6,1),9} = 0$$

Operator 339

$$O_3^{T(6,1),9} = O_{2,2,2,3} - O_{3,3,3,2}$$
$$K_3^{T(6,1),9} = 0$$

Operator 340

$$O_4^{T(6,1),9} = O_{1,1,1,4} - O_{4,4,4,1}$$
$$K_4^{T(6,1),9} = 0$$

Operator 341

$$O_5^{T(6,1),9} = O_{2,2,2,4} - O_{4,4,4,2}$$
$$K_5^{T(6,1),9} = 0$$

Operator 342

$$O_6^{T(6,1),9} = O_{3,3,3,4} - O_{4,4,4,3}$$
$$K_6^{T(6,1),9} = 0$$

# (6, 1) Block 10: Trace = 0, Mixed Symmetry, C = mixed

Operator 343

$$O_1^{T(6,1),10} = O_{1,1,2,1} + O_{1,1,3,1}/2 - O_{2,2,1,2}$$

$$K_1^{T(6,1),10} = 0$$

Operator 344

$$O_2^{T(6,1),10} = O_{1,1,2,1} + 14O_{1,1,3,1} + 9O_{1,1,4,1} + 8O_{2,2,1,2} - 18O_{3,3,1,3} - 9O_{3,3,2,3} - 9O_{3,3,4,3}$$

$$K_2^{T(6,1),10} = 0$$

Operator 345

$$O_3^{T(6,1),10} = O_{1,1,2,1} - 23O_{1,1,3,1}/25 - 19O_{1,1,4,1}/20 + 27O_{2,2,1,2}/50 + 497O_{2,2,3,2}/100 + 249O_{2,2,4,2}/100 + 189O_{3,3,1,3}/$$

$$K_3^{T(6,1),10} = 0$$

Operator 346

$$O_4^{T(6,1),10} = O_{1,1,2,1} - 207O_{1,1,3,1}/50 + 1679O_{1,1,4,1}/100 - 107O_{2,2,1,2}/100 - 389O_{2,2,3,2}/100 + 151O_{2,2,4,2}/50 + 619O_{3,}$$

$$K_4^{T(6,1),10} = 0$$

Operator 347

$$O_5^{T(6,1),10} = O_{1,1,2,1} - 167O_{1,1,3,1}/100 + 159O_{1,1,4,1}/50 + 17O_{2,2,1,2}/100 - 71O_{2,2,3,2}/50 - 121O_{2,2,4,2}/20 + 289O_{3,3,1,3,}$$

$$K_5^{T(6,1),10} = 0$$

Operator 348

$$O_6^{T(6,1),10} = O_{1,1,2,1} + 57O_{1,1,3,1}/100 + 11O_{1,1,4,1}/100 + 129O_{2,2,1,2}/100 + 59O_{2,2,3,2}/100 - 23O_{2,2,4,2}/100 + 21O_{3,3,1,3,}$$

$$K_6^{T(6,1),10} = 0$$

# (6, 2) Block 1: Trace = 0, Mixed Symmetry, C = -1

Operator 349

$$O_1^{T(6,2),1} = O_{1,4,4,4}$$

$$K_1^{T(6,2),1} = 2E(p)p_2$$

Operator 350

$$O_2^{T(6,2),1} = O_{2,1,1,1} - O_{4,3,3,3}$$

$$K_2^{T(6,2),1} = \frac{2ip_1^2(-E(p)m_N - m_N^2 - p_1^2 - p_2^2)}{(E(p)(E(p) + m_N))}$$

Operator 351

$$O_3^{T(6,2),1} = O_{1,2,2,2} - O_{2,1,1,1}/2 - O_{4,3,3,3}/2$$

$$K_3^{T(6,2),1} = \frac{i(E(p)m_Np_1^2 + 2E(p)m_Np_2^2 + m_N^2p_1^2 + 2m_N^2p_2^2 + p_1^4 + 3p_1^2p_2^2 + 2p_2^4)}{(E(p)(E(p) + m_N))}$$

Operator 352

$$O_4^{T(6,2),1} = O_{1,2,2,2} + O_{2,1,1,1} + O_{4,3,3,3}$$

$$K_4^{T(6,2),1} = \frac{2i(-E(p)m_Np_1^2 + E(p)m_Np_2^2 - m_N^2p_1^2 + m_N^2p_2^2 - p_1^4 + p_2^4)}{(E(p)(E(p) + m_N))}$$

Operator 353

$$O_5^{T(6,2),1} = O_{3,2,2,2}$$

$$K_5^{T(6,2),1} = \frac{2ip_1p_2^2p_3}{(E(p)(E(p) + m_N))}$$

Operator 354

$$O_6^{T(6,2),1} = O_{2,3,3,3}$$

$$K_6^{T(6,2),1} = \frac{-2ip_1p_3^3}{(E(p)(E(p) + m_N))}$$

# (6, 2) Block 2: Trace = 0, Mixed Symmetry, C = mixed

Operator 355

$$O_1^{T(6,2),2} = O_{1,1,1,4}$$
$$K_1^{T(6,2),2} = 0$$

Operator 356

$$O_2^{T(6,2),2} = O_{2,2,2,1} - O_{4,4,4,3}$$
$$K_2^{T(6,2),2} = 0$$

Operator 357

$$O_3^{T(6,2),2} = O_{1,1,1,2} - O_{2,2,2,1}/2 - O_{4,4,4,3}/2$$
$$K_3^{T(6,2),2} = 0$$

Operator 358

$$O_4^{T(6,2),2} = O_{1,1,1,2} + O_{2,2,2,1} + O_{4,4,4,3}$$
$$K_4^{T(6,2),2} = 0$$

Operator 359

$$O_5^{T(6,2),2} = O_{3,3,3,2}$$
$$K_5^{T(6,2),2} = 0$$

Operator 360

$$O_6^{T(6,2),2} = O_{2,2,2,3}$$
$$K_6^{T(6,2),2} = 0$$

# (6, 2) Block 3: Trace = 0, Mixed Symmetry, C = mixed

Operator 361

$$O_1^{T(6,2),3} = O_{1,1,4,1}$$
$$K_1^{T(6,2),3} = 0$$

Operator 362

$$O_2^{T(6,2),3} = O_{2,2,1,2} - O_{4,4,3,4}$$
$$K_2^{T(6,2),3} = 0$$

Operator 363

$$O_3^{T(6,2),3} = O_{1,1,2,1} - O_{2,2,1,2}/2 - O_{4,4,3,4}/2$$
$$K_3^{T(6,2),3} = 0$$

Operator 364

$$O_4^{T(6,2),3} = O_{1,1,2,1} + O_{2,2,1,2} + O_{4,4,3,4}$$
$$K_4^{T(6,2),3} = 0$$

Operator 365

$$O_5^{T(6,2),3} = O_{3,3,2,3}$$
$$K_5^{T(6,2),3} = 0$$

Operator 366

$$O_6^{T(6,2),3} = O_{2,2,3,2}$$
$$K_6^{T(6,2),3} = 0$$

# (6, 2) Block 4: Trace = 0, Mixed Symmetry, C = -1

Operator 367

$$O_1^{T(6,2),4} = O_{4,1,1,1}$$

$$K_1^{T(6,2),4} = \frac{2p_1^2 p_2}{E(p)}$$

Operator 368

$$O_2^{T(6,2),4} = O_{1,2,2,2} - O_{3,4,4,4}$$

$$K_2^{T(6,2),4} = \frac{2ip_2^2(E(p)m_N + m_N^2 + p_1^2 + p_2^2)}{(E(p)(E(p) + m_N))}$$

Operator 369

$$O_3^{T(6,2),4} = O_{1,2,2,2} - 2O_{2,1,1,1} + O_{3,4,4,4}$$

$$K_3^{T(6,2),4} = \frac{2i(2E(p)m_N p_1^2 + E(p)m_N p_2^2 + 2m_N^2 p_1^2 + m_N^2 p_2^2 + 2p_1^4 + 3p_1^2 p_2^2 + p_2^4)}{(E(p)(E(p) + m_N))}$$

Operator 370

$$O_4^{T(6,2),4} = O_{1,2,2,2} + O_{2,1,1,1} + O_{3,4,4,4}$$

$$K_4^{T(6,2),4} = \frac{2i(-E(p)m_N p_1^2 + E(p)m_N p_2^2 - m_N^2 p_1^2 + m_N^2 p_2^2 - p_1^4 + p_2^4)}{(E(p)(E(p) + m_N))}$$

Operator 371

$$O_5^{T(6,2),4} = O_{2,3,3,3}$$

$$K_5^{T(6,2),4} = \frac{-2ip_1 p_3^3}{(E(p)(E(p) + m_N))}$$

Operator 372

$$O_6^{T(6,2),4} = -O_{3,2,2,2}$$

$$K_6^{T(6,2),4} = \frac{-2ip_1 p_2^2 p_3}{(E(p)(E(p) + m_N))}$$

# (6, 2) Block 5: Trace = 0, Mixed Symmetry, C = -1

Operator 373

$$O_1^{T(6,2),5} = O_{4,1,4,4}$$

$$K_1^{T(6,2),5} = -2E(p)p_2$$

Operator 374

$$O_2^{T(6,2),5} = O_{1,2,1,1} - O_{3,4,3,3}$$

$$K_2^{T(6,2),5} = \frac{2ip_1^2(E(p)m_N + m_N^2 + p_1^2 + p_2^2)}{(E(p)(E(p) + m_N))}$$

Operator 375

$$O_3^{T(6,2),5} = O_{1,2,1,1} - 2O_{2,1,2,2} + O_{3,4,3,3}$$

$$K_3^{T(6,2),5} = \frac{2i(E(p)m_N p_1^2 + 2E(p)m_N p_2^2 + m_N^2 p_1^2 + 2m_N^2 p_2^2 + p_1^4 + 3p_1^2 p_2^2 + 2p_2^4)}{(E(p)(E(p) + m_N))}$$

Operator 376

$$O_4^{T(6,2),5} = O_{1,2,1,1} + O_{2,1,2,2} + O_{3,4,3,3}$$

$$K_4^{T(6,2),5} = \frac{2i(E(p)m_N p_1^2 - E(p)m_N p_2^2 + m_N^2 p_1^2 - m_N^2 p_2^2 + p_1^4 - p_2^4)}{(E(p)(E(p) + m_N))}$$

Operator 377

$$O_5^{T(6,2),5} = O_{2,3,2,2}$$

$$K_5^{T(6,2),5} = \frac{-2ip_1 p_2^2 p_3}{(E(p)(E(p) + m_N))}$$

Operator 378

$$O_6^{T(6,2),5} = -O_{3,2,3,3}$$

$$K_6^{T(6,2),5} = \frac{-2ip_1 p_3^3}{(E(p)(E(p) + m_N))}$$

# (6, 2) Block 6: Trace = 0, Mixed Symmetry, C = -1

Operator 379

$$O_1^{T(6,2),6} = O_{1,4,1,1}$$

$$K_1^{T(6,2),6} = \frac{-2p_1^2 p_2}{E(p)}$$

Operator 380

$$O_2^{T(6,2),6} = O_{2,1,2,2} - O_{4,3,4,4}$$

$$K_2^{T(6,2),6} = \frac{2ip_2^2(-E(p)m_N - m_N^2 - p_1^2 - p_2^2)}{(E(p)(E(p) + m_N))}$$

Operator 381

$$O_3^{T(6,2),6} = O_{1,2,1,1} - O_{2,1,2,2}/2 - O_{4,3,4,4}/2$$

$$K_3^{T(6,2),6} = \frac{i(2E(p)m_N p_1^2 + E(p)m_N p_2^2 + 2m_N^2 p_1^2 + m_N^2 p_2^2 + 2p_1^4 + 3p_1^2 p_2^2 + p_2^4)}{(E(p)(E(p) + m_N))}$$

Operator 382

$$O_4^{T(6,2),6} = O_{1,2,1,1} + O_{2,1,2,2} + O_{4,3,4,4}$$

$$K_4^{T(6,2),6} = \frac{2i(E(p)m_N p_1^2 - E(p)m_N p_2^2 + m_N^2 p_1^2 - m_N^2 p_2^2 + p_1^4 - p_2^4)}{(E(p)(E(p) + m_N))}$$

Operator 383

$$O_5^{T(6,2),6} = O_{3,2,3,3}$$

$$K_5^{T(6,2),6} = \frac{2ip_1 p_3^3}{(E(p)(E(p) + m_N))}$$

Operator 384

$$O_6^{T(6,2),6} = O_{2,3,2,2}$$

$$K_6^{T(6,2),6} = \frac{-2ip_1 p_2^2 p_3}{(E(p)(E(p) + m_N))}$$

# (6, 3) Block 1: Trace = 0, Mixed Symmetry, C = mixed

Operator 385

$$O_1^{T(6,3),1} = O_{1,1,2,1} + O_{2,2,1,2} + O_{3,3,2,3}/2$$
$$K_1^{T(6,3),1} = 0$$

Operator 386

$$O_2^{T(6,3),1} = O_{1,1,3,1} + O_{3,3,1,3}$$
$$K_2^{T(6,3),1} = 0$$

Operator 387

$$O_3^{T(6,3),1} = O_{1,1,2,1} + O_{2,2,1,2} - 9O_{2,2,3,2}/2 - 4O_{3,3,2,3}$$
$$K_3^{T(6,3),1} = 0$$

Operator 388

$$O_4^{T(6,3),1} = O_{1,1,2,1} - 17O_{1,1,4,1}/5 - 7O_{2,2,1,2}/10 + 3O_{2,2,3,2}/5 - 3O_{3,3,2,3}/5 - 17O_{4,4,1,4}/5$$
$$K_4^{T(6,3),1} = 0$$

Operator 389

$$O_5^{T(6,3),1} = O_{1,1,2,1} + 27O_{1,1,4,1}/100 - 9O_{2,2,1,2}/10 + 19O_{2,2,3,2}/100 + 102O_{2,2,4,2}/25 - 19O_{3,3,2,3}/100 + 27O_{4,4,1,4}/10$$
$$K_5^{T(6,3),1} = 0$$

Operator 390

$$O_6^{T(6,3),1} = O_{1,1,2,1} + 21O_{1,1,4,1}/100 - 117O_{2,2,1,2}/100 - 33O_{2,2,3,2}/100 - O_{2,2,4,2}/4 + 33O_{3,3,2,3}/100 + 479O_{3,3,4,3}/50$$
$$K_6^{T(6,3),1} = 0$$

## (6, 3) Block 2: Trace = 0, Mixed Symmetry, C = -1

Operator 391

$$O_1^{T(6,3),2} = O_{1,2,1,1} + O_{2,1,2,2}$$

$$K_1^{T(6,3),2} = \frac{i(p_1^2 - p_2^2)(m_N(E(p) + m_N - p_3) + m_N(E(p) + m_N + p_3) + (E(p) - p_3)(E(p) + m_N + p_3) + (E(p) + p_3)(E(p)}{(2E(p)(E(p) + m_N))}$$

Operator 392

$$O_2^{T(6,3),2} = O_{1,3,1,1} + O_{3,1,3,3}$$

$$K_2^{T(6,3),2} = \frac{2ip_2p_3(p_1^2 - p_3^2)}{(E(p)(E(p) + m_N))}$$

Operator 393

$$O_3^{T(6,3),2} = O_{2,3,2,2} + O_{3,2,3,3}$$

$$K_3^{T(6,3),2} = \frac{2ip_1p_3(-p_2^2 + p_3^2)}{(E(p)(E(p) + m_N))}$$

Operator 394

$$O_4^{T(6,3),2} = O_{1,4,1,1} + O_{4,1,4,4}$$

$$K_4^{T(6,3),2} = \frac{-2p_2(m_N^2 + 2p_1^2 + p_2^2 + p_3^2)}{E(p)}$$

Operator 395

$$O_5^{T(6,3),2} = O_{2,4,2,2} + O_{4,2,4,4}$$

$$K_5^{T(6,3),2} = \frac{2p_1(m_N^2 + p_1^2 + 2p_2^2 + p_3^2)}{E(p)}$$

Operator 396

$$O_6^{T(6,3),2} = O_{3,4,3,3} + O_{4,3,4,4}$$

$$K_6^{T(6,3),2} = 0$$

## (6, 3) Block 3: Trace = 0, Mixed Symmetry, C = -1

Operator 397

$$O_1^{T(6,3),3} = O_{1,2,2,2} + O_{2,1,1,1}$$

$$K_1^{T(6,3),3} = \frac{-i(p_1^2 - p_2^2)(m_N(E(p) + m_N - p_3) + m_N(E(p) + m_N + p_3) + (E(p) - p_3)(E(p) + m_N + p_3) + (E(p) + p_3)(}{(2E(p)(E(p) + m_N))}$$

Operator 398

$$O_2^{T(6,3),3} = O_{1,3,3,3} + O_{3,1,1,1}$$

$$K_2^{T(6,3),3} = \frac{2ip_2p_3(-p_1^2 + p_3^2)}{(E(p)(E(p) + m_N))}$$

Operator 399

$$O_3^{T(6,3),3} = O_{2,3,3,3} + O_{3,2,2,2}$$

$$K_3^{T(6,3),3} = \frac{2ip_1p_3(p_2^2 - p_3^2)}{(E(p)(E(p) + m_N))}$$

Operator 400

$$O_4^{T(6,3),3} = O_{1,4,4,4} + O_{4,1,1,1}$$

$$K_4^{T(6,3),3} = \frac{2p_2(m_N^2 + 2p_1^2 + p_2^2 + p_3^2)}{E(p)}$$

Operator 401

$$O_5^{T(6,3),3} = O_{2,4,4,4} + O_{4,2,2,2}$$

$$K_5^{T(6,3),3} = \frac{-2p_1(m_N^2 + p_1^2 + 2p_2^2 + p_3^2)}{E(p)}$$

Operator 402

$$O_6^{T(6,3),3} = O_{3,4,4,4} + O_{4,3,3,3}$$

$$K_6^{T(6,3),3} = 0$$

# (6, 3) Block 4: Trace = 0, Mixed Symmetry, C = mixed

Operator 403

$$O_1^{T(6,3),4} = O_{1,1,1,2} + O_{2,2,2,1} - O_{3,3,3,1}/2$$

$$K_1^{T(6,3),4} = 0$$

Operator 404

$$O_2^{T(6,3),4} = O_{1,1,1,2} + 9O_{1,1,1,3}/4 - 13O_{2,2,2,1}/100 - 28O_{2,2,2,3}/25 + 7O_{3,3,3,1}/4 - 28O_{4,4,4,1}/25 - 28O_{4,4,4,3}/25$$

$$K_2^{T(6,3),4} = 0$$

Operator 405

$$O_3^{T(6,3),4} = O_{1,1,1,2} - 47O_{1,1,1,3}/50 - 27O_{2,2,2,1}/25 - 116O_{2,2,2,3}/25 - 17O_{3,3,3,1}/100 - 511O_{3,3,3,2}/100 + 47O_{4,4,4,1}/1($$

$$K_3^{T(6,3),4} = 0$$

Operator 406

$$O_4^{T(6,3),4} = O_{1,1,1,2} + 141O_{1,1,1,3}/100 + 423O_{1,1,1,4}/50 - 19O_{2,2,2,1}/50 - 41O_{2,2,2,3}/20 - 423O_{2,2,2,4}/100 + 31O_{3,3,3,1}/$$

$$K_4^{T(6,3),4} = 0$$

Operator 407

$$O_5^{T(6,3),4} = O_{1,1,1,2} - 33O_{1,1,1,3}/10 + 229O_{1,1,1,4}/50 - 179O_{2,2,2,1}/100 - 723O_{2,2,2,3}/100 - 547O_{2,2,2,4}/25 - 79O_{3,3,3,1}$$

$$K_5^{T(6,3),4} = 0$$

Operator 408

$$O_6^{T(6,3),4} = O_{1,1,1,2} - 147O_{1,1,1,3}/100 + 7O_{1,1,1,4}/50 + 43O_{2,2,2,1}/20 - 183O_{2,2,2,3}/100 + 73O_{2,2,2,4}/20 + 631O_{3,3,3,1}/1($$

$$K_6^{T(6,3),4} = 0$$

## (6, 3) Block 5: Trace = 0, Mixed Symmetry, C = mixed

Operator 409

$$O_1^{T(6,3),5} = O_{1,1,1,2} - O_{1,1,1,3}/2 + O_{2,2,2,1}$$

$$K_1^{T(6,3),5} = 0$$

Operator 410

$$O_2^{T(6,3),5} = O_{1,1,1,2} - 14O_{1,1,1,3} + 9O_{1,1,1,4} - 8O_{2,2,2,1} - 18O_{3,3,3,1} + 9O_{3,3,3,2} + 9O_{3,3,3,4}$$

$$K_2^{T(6,3),5} = 0$$

Operator 411

$$O_3^{T(6,3),5} = O_{1,1,1,2} + 3O_{1,1,1,3}/20 - 11O_{1,1,1,4}/25 - 23O_{2,2,2,1}/25 + 118O_{2,2,2,3}/25 - 59O_{2,2,2,4}/25 + 87O_{3,3,3,1}/100 +$$

$$K_3^{T(6,3),5} = 0$$

Operator 412

$$O_4^{T(6,3),5} = O_{1,1,1,2} - 329O_{1,1,1,3}/100 - 41O_{1,1,1,4}/2 - 66O_{2,2,2,1}/25 - 761O_{2,2,2,3}/100 - 179O_{2,2,2,4}/100 - 371O_{3,3,3,1}/$$

$$K_4^{T(6,3),5} = 0$$

Operator 413

$$O_5^{T(6,3),5} = O_{1,1,1,2} + 22O_{1,1,1,3}/25 + 191O_{1,1,1,4}/50 - 14O_{2,2,2,1}/25 + O_{2,2,2,3}/25 + 1211O_{2,2,2,4}/100 + 46O_{3,3,3,1}/25 +$$

$$K_5^{T(6,3),5} = 0$$

Operator 414

$$O_6^{T(6,3),5} = O_{1,1,1,2} + 293O_{1,1,1,3}/100 + 103O_{1,1,1,4}/100 + 23O_{2,2,2,1}/50 + 81O_{2,2,2,3}/20 + 66O_{2,2,2,4}/25 - 17O_{3,3,3,1}/2$$

$$K_6^{T(6,3),5} = 0$$

## (6, 3) Block 6: Trace = 0, Mixed Symmetry, C = mixed

Operator 415

$$O_1^{T(6,3),6} = O_{1,1,1,2} + O_{2,2,2,1} + O_{3,3,3,2}/2$$
$$K_1^{T(6,3),6} = 0$$

Operator 416

$$O_2^{T(6,3),6} = O_{1,1,1,3} + O_{3,3,3,1}$$
$$K_2^{T(6,3),6} = 0$$

Operator 417

$$O_3^{T(6,3),6} = O_{1,1,1,2} + O_{2,2,2,1} - 9O_{2,2,2,3}/2 - 4O_{3,3,3,2}$$
$$K_3^{T(6,3),6} = 0$$

Operator 418

$$O_4^{T(6,3),6} = O_{1,1,1,2} - 17O_{1,1,1,4}/5 - 7O_{2,2,2,1}/10 + 3O_{2,2,2,3}/5 - 3O_{3,3,3,2}/5 - 17O_{4,4,4,1}/5$$
$$K_4^{T(6,3),6} = 0$$

Operator 419

$$O_5^{T(6,3),6} = O_{1,1,1,2} + 27O_{1,1,1,4}/100 - 9O_{2,2,2,1}/10 + 19O_{2,2,2,3}/100 + 102O_{2,2,2,4}/25 - 19O_{3,3,3,2}/100 + 27O_{4,4,4,1}/10$$
$$K_5^{T(6,3),6} = 0$$

Operator 420

$$O_6^{T(6,3),6} = O_{1,1,1,2} + 21O_{1,1,1,4}/100 - 117O_{2,2,2,1}/100 - 33O_{2,2,2,3}/100 - O_{2,2,2,4}/4 + 33O_{3,3,3,2}/100 + 479O_{3,3,3,4}/50$$
$$K_6^{T(6,3),6} = 0$$

## (6, 3) Block 7: Trace = 0, Mixed Symmetry, C = mixed

Operator 421

$$O_1^{T(6,3),7} = O_{1,1,1,2} + O_{2,2,2,1} + O_{2,2,2,3}/2$$

$$K_1^{T(6,3),7} = 0$$

Operator 422

$$O_2^{T(6,3),7} = O_{1,1,1,2} - 18O_{1,1,1,3}/5 - 4O_{2,2,2,1}/5 - 2O_{2,2,2,3}/5 - 18O_{3,3,3,1}/5 + 9O_{3,3,3,4}/5$$

$$K_2^{T(6,3),7} = 0$$

Operator 423

$$O_3^{T(6,3),7} = O_{1,1,1,2} - 18O_{1,1,1,3}/5 - 18O_{2,2,2,1} + 34O_{2,2,2,3} - 18O_{3,3,3,1}/5 + 172O_{3,3,3,2}/5 - 77O_{3,3,3,4}/5$$

$$K_3^{T(6,3),7} = 0$$

Operator 424

$$O_4^{T(6,3),7} = O_{1,1,1,2} + 37O_{1,1,1,3}/100 + 331O_{1,1,1,4}/50 - 36O_{2,2,2,1}/25 + 89O_{2,2,2,3}/100 + 37O_{3,3,3,1}/100 - 34O_{3,3,3,2}/2$$

$$K_4^{T(6,3),7} = 0$$

Operator 425

$$O_5^{T(6,3),7} = O_{1,1,1,2} + 39O_{1,1,1,3}/50 - 164O_{1,1,1,4}/25 - 161O_{2,2,2,1}/50 + 111O_{2,2,2,3}/25 - 1039O_{2,2,2,4}/50 + 39O_{3,3,3,1}/5$$

$$K_5^{T(6,3),7} = 0$$

Operator 426

$$O_6^{T(6,3),7} = O_{1,1,1,2} - 21O_{1,1,1,3}/25 + 3O_{1,1,1,4}/100 - 17O_{2,2,2,1}/50 - 131O_{2,2,2,3}/100 - 21O_{2,2,2,4}/100 - 21O_{3,3,3,1}/25$$

$$K_6^{T(6,3),7} = 0$$

# (6, 3) Block 8: Trace = 0, Mixed Symmetry, C = mixed

Operator 427

$$O_1^{T(6,3),8} = O_{1,1,2,1} - O_{1,1,3,1}/2 + O_{2,2,1,2}$$

$$K_1^{T(6,3),8} = 0$$

Operator 428

$$O_2^{T(6,3),8} = O_{1,1,2,1} - 14O_{1,1,3,1} + 9O_{1,1,4,1} - 8O_{2,2,1,2} - 18O_{3,3,1,3} + 9O_{3,3,2,3} + 9O_{3,3,4,3}$$

$$K_2^{T(6,3),8} = 0$$

Operator 429

$$O_3^{T(6,3),8} = O_{1,1,2,1} + 3O_{1,1,3,1}/20 - 11O_{1,1,4,1}/25 - 23O_{2,2,1,2}/25 + 118O_{2,2,3,2}/25 - 59O_{2,2,4,2}/25 + 87O_{3,3,1,3}/100 +$$

$$K_3^{T(6,3),8} = 0$$

Operator 430

$$O_4^{T(6,3),8} = O_{1,1,2,1} - 329O_{1,1,3,1}/100 - 41O_{1,1,4,1}/2 - 66O_{2,2,1,2}/25 - 761O_{2,2,3,2}/100 - 179O_{2,2,4,2}/100 - 371O_{3,3,1,3}$$

$$K_4^{T(6,3),8} = 0$$

Operator 431

$$O_5^{T(6,3),8} = O_{1,1,2,1} + 22O_{1,1,3,1}/25 + 191O_{1,1,4,1}/50 - 14O_{2,2,1,2}/25 + O_{2,2,3,2}/25 + 1211O_{2,2,4,2}/100 + 46O_{3,3,1,3}/25 +$$

$$K_5^{T(6,3),8} = 0$$

Operator 432

$$O_6^{T(6,3),8} = O_{1,1,2,1} + 293O_{1,1,3,1}/100 + 103O_{1,1,4,1}/100 + 23O_{2,2,1,2}/50 + 81O_{2,2,3,2}/20 + 66O_{2,2,4,2}/25 - 17O_{3,3,1,3}/2$$

$$K_6^{T(6,3),8} = 0$$

# (6, 3) Block 9: Trace = 0, Mixed Symmetry, C = mixed

Operator 433

$$O_1^{T(6,3),9} = O_{1,1,1,2} + O_{2,2,2,1}$$
$$K_1^{T(6,3),9} = 0$$

Operator 434

$$O_2^{T(6,3),9} = O_{1,1,1,3} + O_{3,3,3,1}$$
$$K_2^{T(6,3),9} = 0$$

Operator 435

$$O_3^{T(6,3),9} = O_{2,2,2,3} + O_{3,3,3,2}$$
$$K_3^{T(6,3),9} = 0$$

Operator 436

$$O_4^{T(6,3),9} = O_{1,1,1,4} + O_{4,4,4,1}$$
$$K_4^{T(6,3),9} = 0$$

Operator 437

$$O_5^{T(6,3),9} = O_{2,2,2,4} + O_{4,4,4,2}$$
$$K_5^{T(6,3),9} = 0$$

Operator 438

$$O_6^{T(6,3),9} = O_{3,3,3,4} + O_{4,4,4,3}$$
$$K_6^{T(6,3),9} = 0$$

# (6, 3) Block 10: Trace = 0, Mixed Symmetry, C = mixed

Operator 439

$$O_1^{T(6,3),10} = O_{1,1,2,1} + O_{2,2,1,2}$$

$$K_1^{T(6,3),10} = 0$$

Operator 440

$$O_2^{T(6,3),10} = O_{1,1,3,1} + O_{3,3,1,3}$$

$$K_2^{T(6,3),10} = 0$$

Operator 441

$$O_3^{T(6,3),10} = O_{2,2,3,2} + O_{3,3,2,3}$$

$$K_3^{T(6,3),10} = 0$$

Operator 442

$$O_4^{T(6,3),10} = O_{1,1,4,1} + O_{4,4,1,4}$$

$$K_4^{T(6,3),10} = 0$$

Operator 443

$$O_5^{T(6,3),10} = O_{2,2,4,2} + O_{4,4,2,4}$$

$$K_5^{T(6,3),10} = 0$$

Operator 444

$$O_6^{T(6,3),10} = O_{3,3,4,3} + O_{4,4,3,4}$$

$$K_6^{T(6,3),10} = 0$$

# (6, 4) Block 1: Trace = 0, Mixed Symmetry, C = -1

Operator 445

$$O_1^{T(6,4),1} = O_{1,4,1,1}$$

$$K_1^{T(6,4),1} = \frac{-2p_1^2 p_2}{E(p)}$$

Operator 446

$$O_2^{T(6,4),1} = O_{2,1,2,2} + O_{4,3,4,4}$$

$$K_2^{T(6,4),1} = \frac{2ip_2^2(-E(p)m_N - m_N^2 - p_1^2 - p_2^2)}{(E(p)(E(p) + m_N))}$$

Operator 447

$$O_3^{T(6,4),1} = O_{1,2,1,1} - O_{2,1,2,2}/2 + O_{4,3,4,4}/2$$

$$K_3^{T(6,4),1} = \frac{i(2E(p)m_N p_1^2 + E(p)m_N p_2^2 + 2m_N^2 p_1^2 + m_N^2 p_2^2 + 2p_1^4 + 3p_1^2 p_2^2 + p_2^4)}{(E(p)(E(p) + m_N))}$$

Operator 448

$$O_4^{T(6,4),1} = O_{1,2,1,1} + O_{2,1,2,2} - O_{4,3,4,4}$$

$$K_4^{T(6,4),1} = \frac{2i(E(p)m_N p_1^2 - E(p)m_N p_2^2 + m_N^2 p_1^2 - m_N^2 p_2^2 + p_1^4 - p_2^4)}{(E(p)(E(p) + m_N))}$$

Operator 449

$$O_5^{T(6,4),1} = O_{3,2,3,3}$$

$$K_5^{T(6,4),1} = \frac{2ip_1 p_3^3}{(E(p)(E(p) + m_N))}$$

Operator 450

$$O_6^{T(6,4),1} = O_{2,3,2,2}$$

$$K_6^{T(6,4),1} = \frac{-2ip_1 p_2^2 p_3}{(E(p)(E(p) + m_N))}$$

# (6, 4) Block 2: Trace = 0, Mixed Symmetry, C = -1

Operator 451

$$O_1^{T(6,4),2} = O_{4,1,4,4}$$

$$K_1^{T(6,4),2} = -2E(p)p_2$$

Operator 452

$$O_2^{T(6,4),2} = O_{1,2,1,1} + O_{3,4,3,3}$$

$$K_2^{T(6,4),2} = \frac{2ip_1^2(E(p)m_N + m_N^2 + p_1^2 + p_2^2)}{(E(p)(E(p) + m_N))}$$

Operator 453

$$O_3^{T(6,4),2} = O_{1,2,1,1} - 2O_{2,1,2,2} - O_{3,4,3,3}$$

$$K_3^{T(6,4),2} = \frac{2i(E(p)m_Np_1^2 + 2E(p)m_Np_2^2 + m_N^2p_1^2 + 2m_N^2p_2^2 + p_1^4 + 3p_1^2p_2^2 + 2p_2^4)}{(E(p)(E(p) + m_N))}$$

Operator 454

$$O_4^{T(6,4),2} = O_{1,2,1,1} + O_{2,1,2,2} - O_{3,4,3,3}$$

$$K_4^{T(6,4),2} = \frac{2i(E(p)m_Np_1^2 - E(p)m_Np_2^2 + m_N^2p_1^2 - m_N^2p_2^2 + p_1^4 - p_2^4)}{(E(p)(E(p) + m_N))}$$

Operator 455

$$O_5^{T(6,4),2} = O_{2,3,2,2}$$

$$K_5^{T(6,4),2} = \frac{-2ip_1p_2^2p_3}{(E(p)(E(p) + m_N))}$$

Operator 456

$$O_6^{T(6,4),2} = -O_{3,2,3,3}$$

$$K_6^{T(6,4),2} = \frac{-2ip_1p_3^3}{(E(p)(E(p) + m_N))}$$

# (6, 4) Block 3: Trace = 0, Mixed Symmetry, C = mixed

Operator 457

$$O_1^{T(6,4),3} = O_{1,1,4,1}$$
$$K_1^{T(6,4),3} = 0$$

Operator 458

$$O_2^{T(6,4),3} = O_{2,2,1,2} + O_{4,4,3,4}$$
$$K_2^{T(6,4),3} = 0$$

Operator 459

$$O_3^{T(6,4),3} = O_{1,1,2,1} - O_{2,2,1,2}/2 + O_{4,4,3,4}/2$$
$$K_3^{T(6,4),3} = 0$$

Operator 460

$$O_4^{T(6,4),3} = O_{1,1,2,1} + O_{2,2,1,2} - O_{4,4,3,4}$$
$$K_4^{T(6,4),3} = 0$$

Operator 461

$$O_5^{T(6,4),3} = O_{3,3,2,3}$$
$$K_5^{T(6,4),3} = 0$$

Operator 462

$$O_6^{T(6,4),3} = O_{2,2,3,2}$$
$$K_6^{T(6,4),3} = 0$$

# (6, 4) Block 4: Trace = 0, Mixed Symmetry, C = -1

Operator 463

$$O_1^{T(6,4),4} = O_{1,4,4,4}$$
$$K_1^{T(6,4),4} = 2E(p)p_2$$

Operator 464

$$O_2^{T(6,4),4} = O_{2,1,1,1} + O_{4,3,3,3}$$
$$K_2^{T(6,4),4} = \frac{2ip_1^2(-E(p)m_N - m_N^2 - p_1^2 - p_2^2)}{(E(p)(E(p) + m_N))}$$

Operator 465

$$O_3^{T(6,4),4} = O_{1,2,2,2} - O_{2,1,1,1}/2 + O_{4,3,3,3}/2$$
$$K_3^{T(6,4),4} = \frac{i(E(p)m_N p_1^2 + 2E(p)m_N p_2^2 + m_N^2 p_1^2 + 2m_N^2 p_2^2 + p_1^4 + 3p_1^2 p_2^2 + 2p_2^4)}{(E(p)(E(p) + m_N))}$$

Operator 466

$$O_4^{T(6,4),4} = O_{1,2,2,2} + O_{2,1,1,1} - O_{4,3,3,3}$$
$$K_4^{T(6,4),4} = \frac{2i(-E(p)m_N p_1^2 + E(p)m_N p_2^2 - m_N^2 p_1^2 + m_N^2 p_2^2 - p_1^4 + p_2^4)}{(E(p)(E(p) + m_N))}$$

Operator 467

$$O_5^{T(6,4),4} = O_{3,2,2,2}$$
$$K_5^{T(6,4),4} = \frac{2ip_1 p_2^2 p_3}{(E(p)(E(p) + m_N))}$$

Operator 468

$$O_6^{T(6,4),4} = O_{2,3,3,3}$$
$$K_6^{T(6,4),4} = \frac{-2ip_1 p_3^3}{(E(p)(E(p) + m_N))}$$

# (6, 4) Block 5: Trace = 0, Mixed Symmetry, C = mixed

Operator 469

$$O_1^{T(6,4),5} = O_{1,1,1,4}$$
$$K_1^{T(6,4),5} = 0$$

Operator 470

$$O_2^{T(6,4),5} = O_{2,2,2,1} + O_{4,4,4,3}$$
$$K_2^{T(6,4),5} = 0$$

Operator 471

$$O_3^{T(6,4),5} = O_{1,1,1,2} - O_{2,2,2,1}/2 + O_{4,4,4,3}/2$$
$$K_3^{T(6,4),5} = 0$$

Operator 472

$$O_4^{T(6,4),5} = O_{1,1,1,2} + O_{2,2,2,1} - O_{4,4,4,3}$$
$$K_4^{T(6,4),5} = 0$$

Operator 473

$$O_5^{T(6,4),5} = O_{3,3,3,2}$$
$$K_5^{T(6,4),5} = 0$$

Operator 474

$$O_6^{T(6,4),5} = O_{2,2,2,3}$$
$$K_6^{T(6,4),5} = 0$$

# (6, 4) Block 6: Trace = 0, Mixed Symmetry, C = -1

Operator 475

$$O_1^{T(6,4),6} = O_{4,1,1,1}$$

$$K_1^{T(6,4),6} = \frac{2p_1^2 p_2}{E(p)}$$

Operator 476

$$O_2^{T(6,4),6} = O_{1,2,2,2} + O_{3,4,4,4}$$

$$K_2^{T(6,4),6} = \frac{2ip_2^2(E(p)m_N + m_N^2 + p_1^2 + p_2^2)}{(E(p)(E(p) + m_N))}$$

Operator 477

$$O_3^{T(6,4),6} = O_{1,2,2,2} - 2O_{2,1,1,1} - O_{3,4,4,4}$$

$$K_3^{T(6,4),6} = \frac{2i(2E(p)m_N p_1^2 + E(p)m_N p_2^2 + 2m_N^2 p_1^2 + m_N^2 p_2^2 + 2p_1^4 + 3p_1^2 p_2^2 + p_2^4)}{(E(p)(E(p) + m_N))}$$

Operator 478

$$O_4^{T(6,4),6} = O_{1,2,2,2} + O_{2,1,1,1} - O_{3,4,4,4}$$

$$K_4^{T(6,4),6} = \frac{2i(-E(p)m_N p_1^2 + E(p)m_N p_2^2 - m_N^2 p_1^2 + m_N^2 p_2^2 - p_1^4 + p_2^4)}{(E(p)(E(p) + m_N))}$$

Operator 479

$$O_5^{T(6,4),6} = O_{2,3,3,3}$$

$$K_5^{T(6,4),6} = \frac{-2ip_1 p_3^3}{(E(p)(E(p) + m_N))}$$

Operator 480

$$O_6^{T(6,4),6} = -O_{3,2,2,2}$$

$$K_6^{T(6,4),6} = \frac{-2ip_1 p_2^2 p_3}{(E(p)(E(p) + m_N))}$$