Testing out DMFormFactor functions

In[5]:= `<< "v6/dmformfactor  -V6.m ";`

Welcome to

DMFormFactor version 1.1.

Functions are SetCoeffsNonrel, SetCoeffsRel, SetCoeffsNucl, ZeroCoeffs,
   SetJChi, SetMchi, SetIsotope, SetHALO, SetHelm , TransitionProbability
   ResponseNucl, DiffCrossSection, ApproxTotalCrossSection, and EventRate.

Event rate

Model setup

In[236]:=
```
(* Model Setup *)
SetJChi[1/2](* WIMP spin *)
SetMChi[MWIMP GeV](* WIMP mass  in GeV *)
Xe131filename = "default";
(* nuclear density matrix  (using default density matrices ) *)
bFM = "default";
(* oscillation parameter  (default: approximate  formulae  used) *)
SetIsotope[54, 131, bFM, Xe131filename ](*[Z,A,bFM,filename ]*)
ZeroCoeffs[];(*Reset all coefficients*)
SetCoeffsNonrel[1, c1p, "p"]
SetCoeffsNonrel[1, c1n, "n"]
SetCoeffsNonrel[2, c2p, "p"]
SetCoeffsNonrel[2, c2n, "n"]
SetCoeffsNonrel[3, c3p, "p"]
SetCoeffsNonrel[3, c3n, "n"]
SetCoeffsNonrel[4, c4p, "p"]
SetCoeffsNonrel[5, c4n, "n"]
(* Set non-zero NR EFT coefficient values *)
```

Getting default matrix ...

Setting isotope to xenon-131.

Attempting to compute a recoil spectrum...

```
(* Parameters  *)
mNucleon = 0.938 GeV;
NT = 1/(131 mNucleon );
(*Number  of target nuclei per detector mass *)
Centimeter = (10^13 Femtometer  );
rhoDM = 0.3 GeV/Centimeter ^3; (*Local dark matter  density*)
ve = 232 KilometerPerSecond ;
(*Earth's velocity in galactic rest frame *)
v0 = 220 KilometerPerSecond ;(*Mean WIMP speed in galactic rest frame *)
SetHALO["MB"];
(*using default MB Halo*)
```

In[438]:= $\mathbf{dRdE = EventRate\big[NT, rhoDM, qGeV, ve, v0\big]}$

Your Lagrangian is

$$L_{prot} = 0. + \frac{0.0000175831 \, i \; S_N \cdot (q \times v^\perp) \, c3p}{GeV^3} +$$
$$\frac{0.0000164977 1 \, c1p}{GeV^2} + \frac{0.0000164977 \, (v^\perp)^2 \, c2p}{GeV^2} + \frac{0.0000164977 \, S_\chi \cdot S_N \, c4p}{GeV^2}$$

$$L_{neut} = 0. + \frac{0.0000175831 \, i \; S_N \cdot (q \times v^\perp) \, c3n}{GeV^3} +$$
$$\frac{0.0000175831 \, i \, S_\chi \cdot (q \times v^\perp) \, c4n}{GeV^3} + \frac{0.0000164977 1 \, c1n}{GeV^2} + \frac{0.0000164977 \, (v^\perp)^2 \, c2n}{GeV^2}$$

Warning: Implementation of O_2 discards v_N^2 piece.

Your event rate is

Out[438]= $\frac{1}{GeV \, MWIMP^3} 2.6053 \times 10^{-44}$

$\Big(646.112 \, e^{-67.4762 \, qGeV^2} \Big(0. + 0.0000227273 \, c1n^2 \, MWIMP^2 + 0.0000318793 \, c1n \, c1p \, MWIMP^2 +$

$0.0000111792 \, c1p^2 \, MWIMP^2 + 4.162 \times 10^{-14} \, c4p^2 \, MWIMP^2 -$
$0.0000113637 \, c1n \, c2n \, qGeV^2 - 7.96983 \times 10^{-6} \, c1p \, c2n \, qGeV^2 -$
$7.96983 \times 10^{-6} \, c1n \, c2p \, qGeV^2 - 5.58958 \times 10^{-6} \, c1p \, c2p \, qGeV^2 -$
$1.84905 \times 10^{-7} \, c1n \, c2n \, MWIMP \, qGeV^2 - 1.29682 \times 10^{-7} \, c1p \, c2n \, MWIMP \, qGeV^2 -$
$1.29682 \times 10^{-7} \, c1n \, c2p \, MWIMP \, qGeV^2 - 9.09514 \times 10^{-8} \, c1p \, c2p \, MWIMP \, qGeV^2 -$
$0.0032662 \, c1n^2 \, MWIMP^2 \, qGeV^2 - 0.00422936 \, c1n \, c1p \, MWIMP^2 \, qGeV^2 -$
$0.00135965 \, c1p^2 \, MWIMP^2 \, qGeV^2 - 7.52174 \times 10^{-10} \, c1n \, c2n \, MWIMP^2 \, qGeV^2 -$
$5.27532 \times 10^{-10} \, c1p \, c2n \, MWIMP^2 \, qGeV^2 - 5.27532 \times 10^{-10} \, c1n \, c2p \, MWIMP^2 \, qGeV^2 -$
$3.69981 \times 10^{-10} \, c1p \, c2p \, MWIMP^2 \, qGeV^2 - 4.7581 \times 10^{-6} \, c1n \, c3n \, MWIMP^2 \, qGeV^2 -$
$3.33706 \times 10^{-6} \, c1p \, c3n \, MWIMP^2 \, qGeV^2 - 3.43233 \times 10^{-6} \, c1n \, c3p \, MWIMP^2 \, qGeV^2 -$
$2.40724 \times 10^{-6} \, c1p \, c3p \, MWIMP^2 \, qGeV^2 + 8.7639 \times 10^{-12} \, c4n \, c4p \, MWIMP^2 \, qGeV^2 -$
$7.48893 \times 10^{-12} \, c4p^2 \, MWIMP^2 \, qGeV^2 + 0.0016331 \, c1n \, c2n \, qGeV^4 +$
$0.00105734 \, c1p \, c2n \, qGeV^4 - 6.54332 \times 10^{-10} \, c2n^2 \, qGeV^4 + 0.00105734 \, c1n \, c2p \, qGeV^4 +$
$0.000679825 \, c1p \, c2p \, qGeV^4 + 3.04188 \times 10^{-10} \, c2n \, c2p \, qGeV^4 +$
$2.28802 \times 10^{-10} \, c2p^2 \, qGeV^4 + 1.18987 \times 10^{-6} \, c2n \, c3n \, qGeV^4 +$
$8.34334 \times 10^{-7} \, c2p \, c3n \, qGeV^4 - 2.39088 \times 10^{-11} \, c3n^2 \, qGeV^4 +$
$8.5809 \times 10^{-7} \, c2n \, c3p \, qGeV^4 + 6.01811 \times 10^{-7} \, c2p \, c3p \, qGeV^4 -$
$1.22764 \times 10^{-12} \, c3n \, c3p \, qGeV^4 - 1.57588 \times 10^{-14} \, c3p^2 \, qGeV^4 -$

$$1.61351 \times 10^{-6} \, c4n^2 \, qGeV^4 + \frac{1.42046 \times 10^{-6} \, c2n^2 \, qGeV^4}{MWIMP^2} + \frac{1.99246 \times 10^{-6} \, c2n \, c2p \, qGeV^4}{MWIMP^2} +$$

$$\frac{6.98698 \times 10^{-7} \, c2p^2 \, qGeV^4}{MWIMP^2} + \frac{4.62262 \times 10^{-8} \, c2n^2 \, qGeV^4}{MWIMP} +$$

$$\frac{6.48409 \times 10^{-8} \, c2n \, c2p \, qGeV^4}{MWIMP} + \frac{2.27379 \times 10^{-8} \, c2p^2 \, qGeV^4}{MWIMP} +$$

$0.0000265731 \, c1n \, c2n \, MWIMP \, qGeV^4 + 0.0000172046 \, c1p \, c2n \, MWIMP \, qGeV^4 -$
$1.67666 \times 10^{-11} \, c2n^2 \, MWIMP \, qGeV^4 + 0.0000172046 \, c1n \, c2p \, MWIMP \, qGeV^4 +$
$0.0000110618 \, c1p \, c2p \, MWIMP \, qGeV^4 - 3.63416 \times 10^{-12} \, c2n \, c2p \, MWIMP \, qGeV^4 +$
$7.12887 \times 10^{-13} \, c2p^2 \, MWIMP \, qGeV^4 + 1.9361 \times 10^{-8} \, c2n \, c3n \, MWIMP \, qGeV^4 +$
$1.35759 \times 10^{-8} \, c2p \, c3n \, MWIMP \, qGeV^4 - 3.89034 \times 10^{-13} \, c3n^2 \, MWIMP \, qGeV^4 +$
$1.39625 \times 10^{-8} \, c2n \, c3p \, MWIMP \, qGeV^4 + 9.79243 \times 10^{-9} \, c2p \, c3p \, MWIMP \, qGeV^4 -$
$1.99756 \times 10^{-14} \, c3n \, c3p \, MWIMP \, qGeV^4 - 2.56421 \times 10^{-16} \, c3p^2 \, MWIMP \, qGeV^4 -$
$2.62543 \times 10^{-8} \, c4n^2 \, MWIMP \, qGeV^4 + 0.186408 \, c1n^2 \, MWIMP^2 \, qGeV^4 +$
$0.219895 \, c1n \, c1p \, MWIMP^2 \, qGeV^4 + 0.0638946 \, c1p^2 \, MWIMP^2 \, qGeV^4 +$
$1.08097 \times 10^{-7} \, c1n \, c2n \, MWIMP^2 \, qGeV^4 + 6.99866 \times 10^{-8} \, c1p \, c2n \, MWIMP^2 \, qGeV^4 -$
$7.4428 \times 10^{-14} \, c2n^2 \, MWIMP^2 \, qGeV^4 + 6.99866 \times 10^{-8} \, c1n \, c2p \, MWIMP^2 \, qGeV^4 +$
$4.49984 \times 10^{-8} \, c1p \, c2p \, MWIMP^2 \, qGeV^4 - 2.35129 \times 10^{-14} \, c2n \, c2p \, MWIMP^2 \, qGeV^4 -$
$1.6123 \times 10^{-16} \, c2p^2 \, MWIMP^2 \, qGeV^4 + 0.000595125 \, c1n \, c3n \, MWIMP^2 \, qGeV^4 +$
$0.000380529 \, c1p \, c3n \, MWIMP^2 \, qGeV^4 + 7.87586 \times 10^{-11} \, c2n \, c3n \, MWIMP^2 \, qGeV^4 +$
$5.52255 \times 10^{-11} \, c2p \, c3n \, MWIMP^2 \, qGeV^4 + 2.49725 \times 10^{-7} \, c3n^2 \, MWIMP^2 \, qGeV^4 +$
$0.000385553 \, c1n \, c3p \, MWIMP^2 \, qGeV^4 + 0.000243818 \, c1p \, c3p \, MWIMP^2 \, qGeV^4 +$
$5.6798 \times 10^{-11} \, c2n \, c3p \, MWIMP^2 \, qGeV^4 + 3.98346 \times 10^{-11} \, c2p \, c3p \, MWIMP^2 \, qGeV^4 +$
$3.59075 \times 10^{-7} \, c3n \, c3p \, MWIMP^2 \, qGeV^4 + 1.29606 \times 10^{-7} \, c3p^2 \, MWIMP^2 \, qGeV^4 +$
$5.8523 \times 10^{-10} \, c4n^2 \, MWIMP^2 \, qGeV^4 - 1.52085 \times 10^{-9} \, c4n \, c4p \, MWIMP^2 \, qGeV^4 +$
$4.56604 \times 10^{-10} \, c4p^2 \, MWIMP^2 \, qGeV^4 - 0.0932038 \, c1n \, c2n \, qGeV^6 -$
$0.0549736 \, c1p \, c2n \, qGeV^6 + 2.45767 \times 10^{-8} \, c2n^2 \, qGeV^6 - 0.0549736 \, c1n \, c2p \, qGeV^6 -$
$0.0319473 \, c1p \, c2p \, qGeV^6 - 6.4141 \times 10^{-8} \, c2n \, c2p \, qGeV^6 - 2.98068 \times 10^{-8} \, c2p^2 \, qGeV^6 -$
$0.00014885 \, c2n \, c3n \, qGeV^6 - 0.0000951459 \, c2p \, c3n \, qGeV^6 + 7.56503 \times 10^{-9} \, c3n^2 \, qGeV^6 -$
$0.0000963897 \, c2n \, c3p \, qGeV^6 - 0.0000609549 \, c2p \, c3p \, qGeV^6 +$
$3.54036 \times 10^{-10} \, c3n \, c3p \, qGeV^6 + 4.10302 \times 10^{-12} \, c3p^2 \, qGeV^6 +$

$$0.000231881 \, c4n^2 \, qGeV^6 - \frac{0.000204137 \, c2n^2 \, qGeV^6}{MWIMP^2} - \frac{0.000264335 \, c2n \, c2p \, qGeV^6}{MWIMP^2} -$$

$$\frac{0.0000849781 \, c2p^2 \, qGeV^6}{MWIMP^2} - \frac{6.64327 \times 10^{-6} \, c2n^2 \, qGeV^6}{MWIMP} - \frac{8.6023 \times 10^{-6} \, c2n \, c2p \, qGeV^6}{MWIMP} -$$

$$\frac{2.76546 \times 10^{-6} \, c2p^2 \, qGeV^6}{MWIMP} - 0.00151657 \, c1n \, c2n \, MWIMP \, qGeV^6 -$$

$0.000894508 \, c1p \, c2n \, MWIMP \, qGeV^6 + 1.27935 \times 10^{-9} \, c2n^2 \, MWIMP \, qGeV^6 -$
$0.000894508 \, c1n \, c2p \, MWIMP \, qGeV^6 - 0.000519833 \, c1p \, c2p \, MWIMP \, qGeV^6 +$
$9.51175 \times 10^{-11} \, c2n \, c2p \, MWIMP \, qGeV^6 - 1.18907 \times 10^{-10} \, c2p^2 \, MWIMP \, qGeV^6 -$
$2.42203 \times 10^{-6} \, c2n \, c3n \, MWIMP \, qGeV^6 - 1.54818 \times 10^{-6} \, c2p \, c3n \, MWIMP \, qGeV^6 +$
$1.23095 \times 10^{-10} \, c3n^2 \, MWIMP \, qGeV^6 - 1.56841 \times 10^{-6} \, c2n \, c3p \, MWIMP \, qGeV^6 -$
$9.91833 \times 10^{-7} \, c2p \, c3p \, MWIMP \, qGeV^6 + 5.76073 \times 10^{-12} \, c3n \, c3p \, MWIMP \, qGeV^6 +$
$6.67627 \times 10^{-14} \, c3p^2 \, MWIMP \, qGeV^6 + 3.77307 \times 10^{-6} \, c4n^2 \, MWIMP \, qGeV^6 -$
$5.50411 \, c1n^2 \, MWIMP^2 \, qGeV^6 - 5.81187 \, c1n \, c1p \, MWIMP^2 \, qGeV^6 -$
$1.49482 \, c1p^2 \, MWIMP^2 \, qGeV^6 - 6.16926 \times 10^{-6} \, c1n \, c2n \, MWIMP^2 \, qGeV^6 -$
$3.63877 \times 10^{-6} \, c1p \, c2n \, MWIMP^2 \, qGeV^6 + 6.09866 \times 10^{-12} \, c2n^2 \, MWIMP^2 \, qGeV^6 -$
$3.63877 \times 10^{-6} \, c1n \, c2p \, MWIMP^2 \, qGeV^6 - 2.11463 \times 10^{-6} \, c1p \, c2p \, MWIMP^2 \, qGeV^6 +$
$1.54505 \times 10^{-12} \, c2n \, c2p \, MWIMP^2 \, qGeV^6 - 1.11388 \times 10^{-13} \, c2p^2 \, MWIMP^2 \, qGeV^6 -$
$0.0291639 \, c1n \, c3n \, MWIMP^2 \, qGeV^6 - 0.0167896 \, c1p \, c3n \, MWIMP^2 \, qGeV^6 -$
$9.85255 \times 10^{-9} \, c2n \, c3n \, MWIMP^2 \, qGeV^6 - 6.29782 \times 10^{-9} \, c2p \, c3n \, MWIMP^2 \, qGeV^6 -$

$$0.0000265736\, c3n^2\, MWIMP^2\, qGeV^6 - 0.016683\, c1n\, c3p\, MWIMP^2\, qGeV^6 -$$
$$0.00939525\, c1p\, c3p\, MWIMP^2\, qGeV^6 - 6.38014\times10^{-9}\, c2n\, c3p\, MWIMP^2\, qGeV^6 -$$
$$4.03467\times10^{-9}\, c2p\, c3p\, MWIMP^2\, qGeV^6 - 0.0000335888\, c3n\, c3p\, MWIMP^2\, qGeV^6 -$$
$$0.0000104998\, c3p^2\, MWIMP^2\, qGeV^6 - 4.46553\times10^{-8}\, c4n^2\, MWIMP^2\, qGeV^6 +$$
$$3.32229\times10^{-8}\, c4n\, c4p\, MWIMP^2\, qGeV^6 + 8.02055\times10^{-9}\, c4p^2\, MWIMP^2\, qGeV^6 +$$
$$2.75205\, c1n\, c2n\, qGeV^8 + 1.45297\, c1p\, c2n\, qGeV^8 + 1.55679\times10^{-7}\, c2n^2\, qGeV^8 +$$
$$1.45297\, c1n\, c2p\, qGeV^8 + 0.74741\, c1p\, c2p\, qGeV^8 + 3.92106\times10^{-6}\, c2n\, c2p\, qGeV^8 +$$
$$1.45581\times10^{-6}\, c2p^2\, qGeV^8 + 0.00729572\, c2n\, c3n\, qGeV^8 + 0.00419828\, c2p\, c3n\, qGeV^8 -$$
$$8.91306\times10^{-7}\, c3n^2\, qGeV^8 + 0.00417078\, c2n\, c3p\, qGeV^8 + 0.00234882\, c2p\, c3p\, qGeV^8 -$$
$$2.93557\times10^{-8}\, c3n\, c3p\, qGeV^8 - 2.39597\times10^{-10}\, c3p^2\, qGeV^8 -$$
$$0.0132338\, c4n^2\, qGeV^8 + \frac{0.0116505\, c2n^2\, qGeV^8}{MWIMP^2} + \frac{0.0137434\, c2n\, c2p\, qGeV^8}{MWIMP^2} +$$
$$\frac{0.00399341\, c2p^2\, qGeV^8}{MWIMP^2} + \frac{0.000379143\, c2n^2\, qGeV^8}{MWIMP} + \frac{0.000447254\, c2n\, c2p\, qGeV^8}{MWIMP} +$$
$$\frac{0.000129958\, c2p^2\, qGeV^8}{MWIMP} + 0.0447803\, c1n\, c2n\, MWIMP\, qGeV^8 +$$
$$0.0236421\, c1p\, c2n\, MWIMP\, qGeV^8 - 4.76587\times10^{-8}\, c2n^2\, MWIMP\, qGeV^8 +$$
$$0.0236421\, c1n\, c2p\, MWIMP\, qGeV^8 + 0.0121615\, c1p\, c2p\, MWIMP\, qGeV^8 +$$
$$4.59335\times10^{-9}\, c2n\, c2p\, MWIMP\, qGeV^8 + 6.48423\times10^{-9}\, c2p^2\, MWIMP\, qGeV^8 +$$
$$0.000118713\, c2n\, c3n\, MWIMP\, qGeV^8 + 0.0000683127\, c2p\, c3n\, MWIMP\, qGeV^8 -$$
$$1.4503\times10^{-8}\, c3n^2\, MWIMP\, qGeV^8 + 0.0000678652\, c2n\, c3p\, MWIMP\, qGeV^8 +$$
$$0.000038219\, c2p\, c3p\, MWIMP\, qGeV^8 - 4.77664\times10^{-10}\, c3n\, c3p\, MWIMP\, qGeV^8 -$$
$$3.89862\times10^{-12}\, c3p^2\, MWIMP\, qGeV^8 - 0.000215336\, c4n^2\, MWIMP\, qGeV^8 +$$
$$92.8759\, c1n^2\, MWIMP^2\, qGeV^8 + 85.8965\, c1n\, c1p\, MWIMP^2\, qGeV^8 +$$
$$19.0549\, c1p^2\, MWIMP^2\, qGeV^8 + 0.000182162\, c1n\, c2n\, MWIMP^2\, qGeV^8 +$$
$$0.0000961735\, c1p\, c2n\, MWIMP^2\, qGeV^8 - 2.44915\times10^{-10}\, c2n^2\, MWIMP^2\, qGeV^8 +$$
$$0.0000961735\, c1n\, c2p\, MWIMP^2\, qGeV^8 + 0.0000494719\, c1p\, c2p\, MWIMP^2\, qGeV^8 -$$
$$4.15283\times10^{-11}\, c2n\, c2p\, MWIMP^2\, qGeV^8 + 8.88097\times10^{-12}\, c2p^2\, MWIMP^2\, qGeV^8 +$$
$$0.728882\, c1n\, c3n\, MWIMP^2\, qGeV^8 + 0.370239\, c1p\, c3n\, MWIMP^2\, qGeV^8 +$$
$$4.82912\times10^{-7}\, c2n\, c3n\, MWIMP^2\, qGeV^8 + 2.77889\times10^{-7}\, c2p\, c3n\, MWIMP^2\, qGeV^8 +$$
$$0.00109923\, c3n^2\, MWIMP^2\, qGeV^8 + 0.363458\, c1n\, c3p\, MWIMP^2\, qGeV^8 +$$
$$0.17819\, c1p\, c3p\, MWIMP^2\, qGeV^8 + 2.76069\times10^{-7}\, c2n\, c3p\, MWIMP^2\, qGeV^8 +$$
$$1.55471\times10^{-7}\, c2p\, c3p\, MWIMP^2\, qGeV^8 + 0.00120804\, c3n\, c3p\, MWIMP^2\, qGeV^8 +$$
$$0.000326067\, c3p^2\, MWIMP^2\, qGeV^8 + 1.66351\times10^{-6}\, c4n^2\, MWIMP^2\, qGeV^8 +$$
$$8.35675\times10^{-7}\, c4n\, c4p\, MWIMP^2\, qGeV^8 + 5.67521\times10^{-8}\, c4p^2\, MWIMP^2\, qGeV^8 -$$
$$46.4379\, c1n\, c2n\, qGeV^{10} - 21.4741\, c1p\, c2n\, qGeV^{10} - 0.0000308595\, c2n^2\, qGeV^{10} -$$
$$21.4741\, c1n\, c2p\, qGeV^{10} - 9.52744\, c1p\, c2p\, qGeV^{10} - 0.00011292\, c2n\, c2p\, qGeV^{10} -$$
$$0.0000348988\, c2p^2\, qGeV^{10} - 0.182392\, c2n\, c3n\, qGeV^{10} - 0.0925883\, c2p\, c3n\, qGeV^{10} +$$
$$0.0000507183\, c3n^2\, qGeV^{10} - 0.0908637\, c2n\, c3p\, qGeV^{10} - 0.0445473\, c2p\, c3p\, qGeV^{10} +$$
$$3.92971\times10^{-7}\, c3n\, c3p\, qGeV^{10} - 7.81956\times10^{-9}\, c3p^2\, qGeV^{10} + 0.390759\, c4n^2\, qGeV^{10} -$$
$$\frac{0.344007\, c2n^2\, qGeV^{10}}{MWIMP^2} - \frac{0.363242\, c2n\, c2p\, qGeV^{10}}{MWIMP^2} - \frac{0.0934262\, c2p^2\, qGeV^{10}}{MWIMP^2} -$$
$$\frac{0.0111951\, c2n^2\, qGeV^{10}}{MWIMP} - \frac{0.011821\, c2n\, c2p\, qGeV^{10}}{MWIMP} - \frac{0.00304039\, c2p^2\, qGeV^{10}}{MWIMP} -$$
$$0.755619\, c1n\, c2n\, MWIMP\, qGeV^{10} - 0.349418\, c1p\, c2n\, MWIMP\, qGeV^{10} +$$
$$9.79897\times10^{-7}\, c2n^2\, MWIMP\, qGeV^{10} - 0.349418\, c1n\, c2p\, MWIMP\, qGeV^{10} -$$
$$0.155027\, c1p\, c2p\, MWIMP\, qGeV^{10} - 2.72491\times10^{-7}\, c2n\, c2p\, MWIMP\, qGeV^{10} -$$
$$1.65365\times10^{-7}\, c2p^2\, MWIMP\, qGeV^{10} - 0.00296781\, c2n\, c3n\, MWIMP\, qGeV^{10} -$$
$$0.00150656\, c2p\, c3n\, MWIMP\, qGeV^{10} + 8.25267\times10^{-7}\, c3n^2\, MWIMP\, qGeV^{10} -$$
$$0.0014785\, c2n\, c3p\, MWIMP\, qGeV^{10} - 0.000724856\, c2p\, c3p\, MWIMP\, qGeV^{10} +$$
$$6.39426\times10^{-9}\, c3n\, c3p\, MWIMP\, qGeV^{10} - 1.27237\times10^{-10}\, c3p^2\, MWIMP\, qGeV^{10} +$$

$$0.00635828\, c4n^2\, MWIMP\, qGeV^{10} - 930.08\, c1n^2\, MWIMP^2\, qGeV^{10} -$$
$$732.247\, c1n\, c1p\, MWIMP^2\, qGeV^{10} - 135.247\, c1p^2\, MWIMP^2\, qGeV^{10} -$$
$$0.00307378\, c1n\, c2n\, MWIMP^2\, qGeV^{10} - 0.0014214\, c1p\, c2n\, MWIMP^2\, qGeV^{10} +$$
$$5.4933 \times 10^{-9}\, c2n^2\, MWIMP^2\, qGeV^{10} - 0.0014214\, c1n\, c2p\, MWIMP^2\, qGeV^{10} -$$
$$0.000630632\, c1p\, c2p\, MWIMP^2\, qGeV^{10} + 4.82993 \times 10^{-10}\, c2n\, c2p\, MWIMP^2\, qGeV^{10} -$$
$$2.63363 \times 10^{-10}\, c2p^2\, MWIMP^2\, qGeV^{10} - 10.2285\, c1n\, c3n\, MWIMP^2\, qGeV^{10} -$$
$$4.47154\, c1p\, c3n\, MWIMP^2\, qGeV^{10} - 0.0000120727\, c2n\, c3n\, MWIMP^2\, qGeV^{10} -$$
$$6.12852 \times 10^{-6}\, c2p\, c3n\, MWIMP^2\, qGeV^{10} - 0.0228338\, c3n^2\, MWIMP^2\, qGeV^{10} -$$
$$4.35493\, c1n\, c3p\, MWIMP^2\, qGeV^{10} - 1.80184\, c1p\, c3p\, MWIMP^2\, qGeV^{10} -$$
$$6.01437 \times 10^{-6}\, c2n\, c3p\, MWIMP^2\, qGeV^{10} - 2.94864 \times 10^{-6}\, c2p\, c3p\, MWIMP^2\, qGeV^{10} -$$
$$0.0215409\, c3n\, c3p\, MWIMP^2\, qGeV^{10} - 0.00492427\, c3p^2\, MWIMP^2\, qGeV^{10} -$$
$$0.0000342029\, c4n^2\, MWIMP^2\, qGeV^{10} - 0.0000534915\, c4n\, c4p\, MWIMP^2\, qGeV^{10} -$$
$$0.0000179622\, c4p^2\, MWIMP^2\, qGeV^{10} + 465.04\, c1n\, c2n\, qGeV^{12} +$$
$$183.062\, c1p\, c2n\, qGeV^{12} + 0.000857032\, c2n^2\, qGeV^{12} + 183.062\, c1n\, c2p\, qGeV^{12} +$$
$$67.6233\, c1p\, c2p\, qGeV^{12} + 0.00178237\, c2n\, c2p\, qGeV^{12} + 0.000452891\, c2p^2\, qGeV^{12} +$$
$$2.56069\, c2n\, c3n\, qGeV^{12} + 1.11838\, c2p\, c3n\, qGeV^{12} - 0.00160652\, c3n^2\, qGeV^{12} +$$
$$1.08868\, c2n\, c3p\, qGeV^{12} + 0.450451\, c2p\, c3p\, qGeV^{12} + 0.0000272995\, c3n\, c3p\, qGeV^{12} +$$
$$1.2211 \times 10^{-7}\, c3p^2\, qGeV^{12} - 6.59364\, c4n^2\, qGeV^{12} + \frac{5.80474\, c2n^2\, qGeV^{12}}{MWIMP^2} +$$
$$\frac{5.36853\, c2n\, c2p\, qGeV^{12}}{MWIMP^2} + \frac{1.19093\, c2p^2\, qGeV^{12}}{MWIMP^2} + \frac{0.188905\, c2n^2\, qGeV^{12}}{MWIMP} +$$
$$\frac{0.174709\, c2n\, c2p\, qGeV^{12}}{MWIMP} + \frac{0.0387567\, c2p^2\, qGeV^{12}}{MWIMP} + 7.56694\, c1n\, c2n\, MWIMP\, qGeV^{12} +$$
$$2.97871\, c1p\, c2n\, MWIMP\, qGeV^{12} - 0.0000110624\, c2n^2\, MWIMP\, qGeV^{12} +$$
$$2.97871\, c1n\, c2p\, MWIMP\, qGeV^{12} + 1.10034\, c1p\, c2p\, MWIMP\, qGeV^{12} +$$
$$5.87353 \times 10^{-6}\, c2n\, c2p\, MWIMP\, qGeV^{12} + 2.23856 \times 10^{-6}\, c2p^2\, MWIMP\, qGeV^{12} +$$
$$0.0416665\, c2n\, c3n\, MWIMP\, qGeV^{12} + 0.0181978\, c2p\, c3n\, MWIMP\, qGeV^{12} -$$
$$0.0000261406\, c3n^2\, MWIMP\, qGeV^{12} + 0.0177145\, c2n\, c3p\, MWIMP\, qGeV^{12} +$$
$$0.00732955\, c2p\, c3p\, MWIMP\, qGeV^{12} + 4.44207 \times 10^{-7}\, c3n\, c3p\, MWIMP\, qGeV^{12} +$$
$$1.98692 \times 10^{-9}\, c3p^2\, MWIMP\, qGeV^{12} - 0.107289\, c4n^2\, MWIMP\, qGeV^{12} +$$
$$5519.23\, c1n^2\, MWIMP^2\, qGeV^{12} + 3552.73\, c1n\, c1p\, MWIMP^2\, qGeV^{12} +$$
$$519.262\, c1p^2\, MWIMP^2\, qGeV^{12} + 0.0307815\, c1n\, c2n\, MWIMP^2\, qGeV^{12} +$$
$$0.0121171\, c1p\, c2n\, MWIMP^2\, qGeV^{12} - 7.04327 \times 10^{-8}\, c2n^2\, MWIMP^2\, qGeV^{12} +$$
$$0.0121171\, c1n\, c2p\, MWIMP^2\, qGeV^{12} + 0.00447606\, c1p\, c2p\, MWIMP^2\, qGeV^{12} +$$
$$3.71956 \times 10^{-10}\, c2n\, c2p\, MWIMP^2\, qGeV^{12} + 3.88846 \times 10^{-9}\, c2p^2\, MWIMP^2\, qGeV^{12} +$$
$$83.2804\, c1n\, c3n\, MWIMP^2\, qGeV^{12} + 30.3003\, c1p\, c3n\, MWIMP^2\, qGeV^{12} +$$
$$0.000169495\, c2n\, c3n\, MWIMP^2\, qGeV^{12} + 0.0000740267\, c2p\, c3n\, MWIMP^2\, qGeV^{12} +$$
$$0.261339\, c3n^2\, MWIMP^2\, qGeV^{12} + 29.1708\, c1n\, c3p\, MWIMP^2\, qGeV^{12} +$$
$$9.71304\, c1p\, c3p\, MWIMP^2\, qGeV^{12} + 0.0000720609\, c2n\, c3p\, MWIMP^2\, qGeV^{12} +$$
$$0.0000298159\, c2p\, c3p\, MWIMP^2\, qGeV^{12} + 0.206451\, c3n\, c3p\, MWIMP^2\, qGeV^{12} +$$
$$0.0384465\, c3p^2\, MWIMP^2\, qGeV^{12} + 0.000386127\, c4n^2\, MWIMP^2\, qGeV^{12} +$$
$$0.000937086\, c4n\, c4p\, MWIMP^2\, qGeV^{12} + 0.000336658\, c4p^2\, MWIMP^2\, qGeV^{12} -$$
$$2759.62\, c1n\, c2n\, qGeV^{14} - 888.182\, c1p\, c2n\, qGeV^{14} - 0.0128111\, c2n^2\, qGeV^{14} -$$
$$888.182\, c1n\, c2p\, qGeV^{14} - 259.631\, c1p\, c2p\, qGeV^{14} - 0.0161856\, c2n\, c2p\, qGeV^{14} -$$
$$0.00326407\, c2p^2\, qGeV^{14} - 20.8614\, c2n\, c3n\, qGeV^{14} - 7.57972\, c2p\, c3n\, qGeV^{14} +$$
$$0.0288737\, c3n^2\, qGeV^{14} - 7.29175\, c2n\, c3p\, qGeV^{14} - 2.42815\, c2p\, c3p\, qGeV^{14} -$$
$$0.00103918\, c3n\, c3p\, qGeV^{14} + 7.05702 \times 10^{-6}\, c3p^2\, qGeV^{14} + 66.0302\, c4n^2\, qGeV^{14} -$$
$$\frac{58.13\, c2n^2\, qGeV^{14}}{MWIMP^2} - \frac{45.7654\, c2n\, c2p\, qGeV^{14}}{MWIMP^2} - \frac{8.45291\, c2p^2\, qGeV^{14}}{MWIMP^2} -$$
$$\frac{1.89173\, c2n^2\, qGeV^{14}}{MWIMP} - \frac{1.48935\, c2n\, c2p\, qGeV^{14}}{MWIMP} - \frac{0.275085\, c2p^2\, qGeV^{14}}{MWIMP} -$$

$44.9033\,c1n\,c2n\,MWIMP\,qGeV^{14} - 14.4521\,c1p\,c2n\,MWIMP\,qGeV^{14} +$
$0.000041975\,c2n^2\,MWIMP\,qGeV^{14} - 14.4521\,c1n\,c2p\,MWIMP\,qGeV^{14} -$
$4.22461\,c1p\,c2p\,MWIMP\,qGeV^{14} - 0.0000662013\,c2n\,c2p\,MWIMP\,qGeV^{14} -$
$0.0000166953\,c2p^2\,MWIMP\,qGeV^{14} - 0.339449\,c2n\,c3n\,MWIMP\,qGeV^{14} -$
$0.123334\,c2p\,c3n\,MWIMP\,qGeV^{14} + 0.000469822\,c3n^2\,MWIMP\,qGeV^{14} -$
$0.118648\,c2n\,c3p\,MWIMP\,qGeV^{14} - 0.0395098\,c2p\,c3p\,MWIMP\,qGeV^{14} -$
$0.0000169092\,c3n\,c3p\,MWIMP\,qGeV^{14} + 1.14829\times10^{-7}\,c3p^2\,MWIMP\,qGeV^{14} +$
$1.07442\,c4n^2\,MWIMP\,qGeV^{14} - 18567.4\,c1n^2\,MWIMP^2\,qGeV^{14} -$
$9174.3\,c1n\,c1p\,MWIMP^2\,qGeV^{14} - 978.253\,c1p^2\,MWIMP^2\,qGeV^{14} -$
$0.182662\,c1n\,c2n\,MWIMP^2\,qGeV^{14} - 0.0587898\,c1p\,c2n\,MWIMP^2\,qGeV^{14} +$
$4.25433\times10^{-7}\,c2n^2\,MWIMP^2\,qGeV^{14} - 0.0587898\,c1n\,c2p\,MWIMP^2\,qGeV^{14} -$
$0.0171853\,c1p\,c2p\,MWIMP^2\,qGeV^{14} - 6.87893\times10^{-8}\,c2n\,c2p\,MWIMP^2\,qGeV^{14} -$
$3.08804\times10^{-8}\,c2p^2\,MWIMP^2\,qGeV^{14} - 389.244\,c1n\,c3n\,MWIMP^2\,qGeV^{14} -$
$112.383\,c1p\,c3n\,MWIMP^2\,qGeV^{14} - 0.00138084\,c2n\,c3n\,MWIMP^2\,qGeV^{14} -$
$0.00050171\,c2p\,c3n\,MWIMP^2\,qGeV^{14} - 1.69262\,c3n^2\,MWIMP^2\,qGeV^{14} -$
$104.043\,c1n\,c3p\,MWIMP^2\,qGeV^{14} - 25.6444\,c1p\,c3p\,MWIMP^2\,qGeV^{14} -$
$0.00048265\,c2n\,c3p\,MWIMP^2\,qGeV^{14} - 0.000160722\,c2p\,c3p\,MWIMP^2\,qGeV^{14} -$
$1.06518\,c3n\,c3p\,MWIMP^2\,qGeV^{14} - 0.14849\,c3p^2\,MWIMP^2\,qGeV^{14} -$
$0.00146512\,c4n^2\,MWIMP^2\,qGeV^{14} - 0.00666643\,c4n\,c4p\,MWIMP^2\,qGeV^{14} -$
$0.00213379\,c4p^2\,MWIMP^2\,qGeV^{14} + 9283.69\,c1n\,c2n\,qGeV^{16} +$
$2293.57\,c1p\,c2n\,qGeV^{16} + 0.105924\,c2n^2\,qGeV^{16} + 2293.57\,c1n\,c2p\,qGeV^{16} +$
$489.126\,c1p\,c2p\,qGeV^{16} + 0.0834895\,c2n\,c2p\,qGeV^{16} + 0.0127172\,c2p^2\,qGeV^{16} +$
$97.5569\,c2n\,c3n\,qGeV^{16} + 28.118\,c2p\,c3n\,qGeV^{16} - 0.287266\,c3n^2\,qGeV^{16} +$
$26.004\,c2n\,c3p\,qGeV^{16} + 6.41047\,c2p\,c3p\,qGeV^{16} + 0.0139006\,c3n\,c3p\,qGeV^{16} -$

$0.00016071\,c3p^2\,qGeV^{16} - 391.833\,c4n^2\,qGeV^{16} + \dfrac{344.952\,c2n^2\,qGeV^{16}}{MWIMP^2} +$

$\dfrac{222.046\,c2n\,c2p\,qGeV^{16}}{MWIMP^2} + \dfrac{32.4539\,c2p^2\,qGeV^{16}}{MWIMP^2} + \dfrac{11.2258\,c2n^2\,qGeV^{16}}{MWIMP} +$

$\dfrac{7.22607\,c2n\,c2p\,qGeV^{16}}{MWIMP} + \dfrac{1.05615\,c2p^2\,qGeV^{16}}{MWIMP} + 151.06\,c1n\,c2n\,MWIMP\,qGeV^{16} +$

$37.3201\,c1p\,c2n\,MWIMP\,qGeV^{16} + 0.000237445\,c2n^2\,MWIMP\,qGeV^{16} +$
$37.3201\,c1n\,c2p\,MWIMP\,qGeV^{16} + 7.95886\,c1p\,c2p\,MWIMP\,qGeV^{16} +$
$0.000401904\,c2n\,c2p\,MWIMP\,qGeV^{16} + 0.0000671125\,c2p^2\,MWIMP\,qGeV^{16} +$
$1.58741\,c2n\,c3n\,MWIMP\,qGeV^{16} + 0.457525\,c2p\,c3n\,MWIMP\,qGeV^{16} -$
$0.00467427\,c3n^2\,MWIMP\,qGeV^{16} + 0.423126\,c2n\,c3p\,MWIMP\,qGeV^{16} +$
$0.104309\,c2p\,c3p\,MWIMP\,qGeV^{16} + 0.000226185\,c3n\,c3p\,MWIMP\,qGeV^{16} -$
$2.61501\times10^{-6}\,c3p^2\,MWIMP\,qGeV^{16} - 6.37575\,c4n^2\,MWIMP\,qGeV^{16} +$
$31574.9\,c1n^2\,MWIMP^2\,qGeV^{16} + 10672.\,c1n\,c1p\,MWIMP^2\,qGeV^{16} +$
$705.043\,c1p^2\,MWIMP^2\,qGeV^{16} + 0.614498\,c1n\,c2n\,MWIMP^2\,qGeV^{16} +$
$0.151814\,c1p\,c2n\,MWIMP^2\,qGeV^{16} - 5.45427\times10^{-7}\,c2n^2\,MWIMP^2\,qGeV^{16} +$
$0.151814\,c1n\,c2p\,MWIMP^2\,qGeV^{16} + 0.0323758\,c1p\,c2p\,MWIMP^2\,qGeV^{16} +$
$6.62064\times10^{-7}\,c2n\,c2p\,MWIMP^2\,qGeV^{16} + 1.30817\times10^{-7}\,c2p^2\,MWIMP^2\,qGeV^{16} +$
$981.431\,c1n\,c3n\,MWIMP^2\,qGeV^{16} + 208.294\,c1p\,c3n\,MWIMP^2\,qGeV^{16} +$
$0.0064574\,c2n\,c3n\,MWIMP^2\,qGeV^{16} + 0.00186116\,c2p\,c3n\,MWIMP^2\,qGeV^{16} +$
$6.07763\,c3n^2\,MWIMP^2\,qGeV^{16} + 167.138\,c1n\,c3p\,MWIMP^2\,qGeV^{16} +$
$24.9094\,c1p\,c3p\,MWIMP^2\,qGeV^{16} + 0.00172123\,c2n\,c3p\,MWIMP^2\,qGeV^{16} +$
$0.000424316\,c2p\,c3p\,MWIMP^2\,qGeV^{16} + 2.73257\,c3n\,c3p\,MWIMP^2\,qGeV^{16} +$
$0.224232\,c3p^2\,MWIMP^2\,qGeV^{16} - 0.0082879\,c4n^2\,MWIMP^2\,qGeV^{16} +$
$0.0171861\,c4n\,c4p\,MWIMP^2\,qGeV^{16} + 0.00445153\,c4p^2\,MWIMP^2\,qGeV^{16} -$
$15787.4\,c1n\,c2n\,qGeV^{18} - 2668.\,c1p\,c2n\,qGeV^{18} - 0.444812\,c2n^2\,qGeV^{18} -$
$2668.\,c1n\,c2p\,qGeV^{18} - 352.521\,c1p\,c2p\,qGeV^{18} - 0.226465\,c2n\,c2p\,qGeV^{18} -$
$0.0242819\,c2p^2\,qGeV^{18} - 245.957\,c2n\,c3n\,qGeV^{18} - 52.1152\,c2p\,c3n\,qGeV^{18} +$

$$1.45143\,c3n^2\,qGeV^{18} - 41.7673\,c2n\,c3p\,qGeV^{18} - 6.22611\,c2p\,c3p\,qGeV^{18} -$$

$$0.0793894\,c3n\,c3p\,qGeV^{18} + 0.00107797\,c3p^2\,qGeV^{18} + 1318.18\,c4n^2\,qGeV^{18} -$$

$$\frac{1160.46\,c2n^2\,qGeV^{18}}{MWIMP^2} - \frac{573.394\,c2n\,c2p\,qGeV^{18}}{MWIMP^2} - \frac{61.1408\,c2p^2\,qGeV^{18}}{MWIMP^2} -$$

$$\frac{37.7651\,c2n^2\,qGeV^{18}}{MWIMP} - \frac{18.6601\,c2n\,c2p\,qGeV^{18}}{MWIMP} - \frac{1.98972\,c2p^2\,qGeV^{18}}{MWIMP} -$$

$$256.887\,c1n\,c2n\,MWIMP\,qGeV^{18} - 43.4125\,c1p\,c2n\,MWIMP\,qGeV^{18} -$$

$$0.00223836\,c2n^2\,MWIMP\,qGeV^{18} - 43.4125\,c1n\,c2p\,MWIMP\,qGeV^{18} -$$

$$5.73608\,c1p\,c2p\,MWIMP\,qGeV^{18} - 0.00121468\,c2n\,c2p\,MWIMP\,qGeV^{18} -$$

$$0.000131702\,c2p^2\,MWIMP\,qGeV^{18} - 4.00211\,c2n\,c3n\,MWIMP\,qGeV^{18} -$$

$$0.847997\,c2p\,c3n\,MWIMP\,qGeV^{18} + 0.0236171\,c3n^2\,MWIMP\,qGeV^{18} -$$

$$0.67962\,c2n\,c3p\,MWIMP\,qGeV^{18} - 0.101309\,c2p\,c3p\,MWIMP\,qGeV^{18} -$$

$$0.00129179\,c3n\,c3p\,MWIMP\,qGeV^{18} + 0.0000175403\,c3p^2\,MWIMP\,qGeV^{18} +$$

$$21.4488\,c4n^2\,MWIMP\,qGeV^{18} - 20747.6\,c1n^2\,MWIMP^2\,qGeV^{18} -$$

$$3563.21\,c1n\,c1p\,MWIMP^2\,qGeV^{18} - 0.000514314\,c1p^2\,MWIMP^2\,qGeV^{18} -$$

$$1.04499\,c1n\,c2n\,MWIMP^2\,qGeV^{18} - 0.176598\,c1p\,c2n\,MWIMP^2\,qGeV^{18} -$$

$$4.02114\times10^{-6}\,c2n^2\,MWIMP^2\,qGeV^{18} - 0.176598\,c1n\,c2p\,MWIMP^2\,qGeV^{18} -$$

$$0.0233338\,c1p\,c2p\,MWIMP^2\,qGeV^{18} - 2.42902\times10^{-6}\,c2n\,c2p\,MWIMP^2\,qGeV^{18} -$$

$$2.67874\times10^{-7}\,c2p^2\,MWIMP^2\,qGeV^{18} - 1136.65\,c1n\,c3n\,MWIMP^2\,qGeV^{18} -$$

$$149.959\,c1p\,c3n\,MWIMP^2\,qGeV^{18} - 0.0162802\,c2n\,c3n\,MWIMP^2\,qGeV^{18} -$$

$$0.00344956\,c2p\,c3n\,MWIMP^2\,qGeV^{18} - 11.0883\,c3n^2\,MWIMP^2\,qGeV^{18} -$$

$$63.1436\,c1n\,c3p\,MWIMP^2\,qGeV^{18} - 0.0000308982\,c1p\,c3p\,MWIMP^2\,qGeV^{18} -$$

$$0.00276462\,c2n\,c3p\,MWIMP^2\,qGeV^{18} - 0.000412113\,c2p\,c3p\,MWIMP^2\,qGeV^{18} -$$

$$2.65743\,c3n\,c3p\,MWIMP^2\,qGeV^{18} - 3.18066\times10^{-7}\,c3p^2\,MWIMP^2\,qGeV^{18} +$$

$$0.0781292\,c4n^2\,MWIMP^2\,qGeV^{18} - 0.00457787\,c4n\,c4p\,MWIMP^2\,qGeV^{18} -$$

$$4.73827\times10^{-8}\,c4p^2\,MWIMP^2\,qGeV^{18} + 10373.8\,c1n\,c2n\,qGeV^{20} +$$

$$890.802\,c1p\,c2n\,qGeV^{20} + 0.781436\,c2n^2\,qGeV^{20} + 890.802\,c1n\,c2p\,qGeV^{20} +$$

$$0.000257157\,c1p\,c2p\,qGeV^{20} + 0.264897\,c2n\,c2p\,qGeV^{20} + 0.0175003\,c2p^2\,qGeV^{20} +$$

$$284.27\,c2n\,c3n\,qGeV^{20} + 37.4858\,c2p\,c3n\,qGeV^{20} - 2.83701\,c3n^2\,qGeV^{20} +$$

$$15.7813\,c2n\,c3p\,qGeV^{20} + 7.70896\times10^{-6}\,c2p\,c3p\,qGeV^{20} + 0.160827\,c3n\,c3p\,qGeV^{20} -$$

$$0.00231395\,c3p^2\,qGeV^{20} - 2241.63\,c4n^2\,qGeV^{20} + \frac{1973.43\,c2n^2\,qGeV^{20}}{MWIMP^2} +$$

$$\frac{666.999\,c2n\,c2p\,qGeV^{20}}{MWIMP^2} + \frac{44.0652\,c2p^2\,qGeV^{20}}{MWIMP^2} + \frac{64.2217\,c2n^2\,qGeV^{20}}{MWIMP} +$$

$$\frac{21.7063\,c2n\,c2p\,qGeV^{20}}{MWIMP} + \frac{1.43402\,c2p^2\,qGeV^{20}}{MWIMP} + 168.798\,c1n\,c2n\,MWIMP\,qGeV^{20} +$$

$$14.4948\,c1p\,c2n\,MWIMP\,qGeV^{20} + 0.0042134\,c2n^2\,MWIMP\,qGeV^{20} +$$

$$14.4948\,c1n\,c2p\,MWIMP\,qGeV^{20} + 4.18435\times10^{-6}\,c1p\,c2p\,MWIMP\,qGeV^{20} +$$

$$0.00143676\,c2n\,c2p\,MWIMP\,qGeV^{20} + 0.0000949195\,c2p^2\,MWIMP\,qGeV^{20} +$$

$$4.62552\,c2n\,c3n\,MWIMP\,qGeV^{20} + 0.609954\,c2p\,c3n\,MWIMP\,qGeV^{20} -$$

$$0.0461627\,c3n^2\,MWIMP\,qGeV^{20} + 0.256787\,c2n\,c3p\,MWIMP\,qGeV^{20} +$$

$$1.25437\times10^{-7}\,c2p\,c3p\,MWIMP\,qGeV^{20} + 0.00261691\,c3n\,c3p\,MWIMP\,qGeV^{20} -$$

$$0.0000376516\,c3p^2\,MWIMP\,qGeV^{20} - 36.4749\,c4n^2\,MWIMP\,qGeV^{20} +$$

$$4504.35\,c1n^2\,MWIMP^2\,qGeV^{20} + 0.00130359\,c1n\,c1p\,MWIMP^2\,qGeV^{20} +$$

$$9.54602\times10^{-11}\,c1p^2\,MWIMP^2\,qGeV^{20} + 0.686654\,c1n\,c2n\,MWIMP^2\,qGeV^{20} +$$

$$0.0589632\,c1p\,c2n\,MWIMP^2\,qGeV^{20} + 8.49353\times10^{-6}\,c2n^2\,MWIMP^2\,qGeV^{20} +$$

$$0.0589632\,c1n\,c2p\,MWIMP^2\,qGeV^{20} + 1.70215\times10^{-8}\,c1p\,c2p\,MWIMP^2\,qGeV^{20} +$$

$$2.9223\times10^{-6}\,c2n\,c2p\,MWIMP^2\,qGeV^{20} + 1.93061\times10^{-7}\,c2p^2\,MWIMP^2\,qGeV^{20} +$$

$$379.135\,c1n\,c3n\,MWIMP^2\,qGeV^{20} + 0.0000548624\,c1p\,c3n\,MWIMP^2\,qGeV^{20} +$$

$$0.0188162\,c2n\,c3n\,MWIMP^2\,qGeV^{20} + 0.00248123\,c2p\,c3n\,MWIMP^2\,qGeV^{20} +$$

$$7.97785\,c3n^2\,MWIMP^2\,qGeV^{20} + 0.0000548624\,c1n\,c3p\,MWIMP^2\,qGeV^{20} +$$

8.03497×10^{-12} c1p c3p MWIMP^2 qGeV^{20} + 0.00104458 c2n c3p MWIMP^2 qGeV^{20} +

5.10265×10^{-10} c2p c3p MWIMP^2 qGeV^{20} + 0.0000129542 c3n c3p MWIMP^2 qGeV^{20} −

1.53163×10^{-7} c3p^2 MWIMP^2 qGeV^{20} − 0.147067 c4n^2 MWIMP^2 qGeV^{20} +

2.66248×10^{-8} c4n c4p MWIMP^2 qGeV^{20} + 1.39229×10^{-13} c4p^2 MWIMP^2 qGeV^{20} −

2252.18 c1n c2n qGeV^{22} − 0.000325899 c1p c2n qGeV^{22} − 0.514991 c2n^2 qGeV^{22} −

0.000325899 c1n c2p qGeV^{22} − 4.77301×10^{-11} c1p c2p qGeV^{22} −

0.0884448 c2n c2p qGeV^{22} − 1.27661×10^{-8} c2p^2 qGeV^{22} −

94.7693 c2n c3n qGeV^{22} − 0.000013689 c2p c3n qGeV^{22} − 0.506643 c3n^2 qGeV^{22} −

0.000013689 c2n c3p qGeV^{22} − 1.95929×10^{-12} c2p c3p qGeV^{22} +

0.0144853 c3n c3p qGeV^{22} + 2.61044×10^{-8} c3p^2 qGeV^{22} + 1472.96 c4n^2 qGeV^{22} −

$\dfrac{1296.73\ \text{c2n}^2\ \text{qGeV}^{22}}{\text{MWIMP}^2}$ − $\dfrac{222.7\ \text{c2n c2p qGeV}^{22}}{\text{MWIMP}^2}$ − $\dfrac{0.0000321446\ \text{c2p}^2\ \text{qGeV}^{22}}{\text{MWIMP}^2}$ −

$\dfrac{42.1996\ \text{c2n}^2\ \text{qGeV}^{22}}{\text{MWIMP}}$ − $\dfrac{7.24738\ \text{c2n c2p qGeV}^{22}}{\text{MWIMP}}$ − $\dfrac{1.04609 \times 10^{-6}\ \text{c2p}^2\ \text{qGeV}^{22}}{\text{MWIMP}}$ −

36.6465 c1n c2n MWIMP qGeV^{22} − 5.30289×10^{-6} c1p c2n MWIMP qGeV^{22} −

0.00279324 c2n^2 MWIMP qGeV^{22} − 5.30289×10^{-6} c1n c2p MWIMP qGeV^{22} −

7.76645×10^{-13} c1p c2p MWIMP qGeV^{22} − 0.000479712 c2n c2p MWIMP qGeV^{22} −

6.92418×10^{-11} c2p^2 MWIMP qGeV^{22} − 1.54205 c2n c3n MWIMP qGeV^{22} −

2.22741×10^{-7} c2p c3n MWIMP qGeV^{22} − 0.00824388 c3n^2 MWIMP qGeV^{22} −

2.22741×10^{-7} c2n c3p MWIMP qGeV^{22} − 3.18807×10^{-14} c2p c3p MWIMP qGeV^{22} +

0.000235699 c3n c3p MWIMP qGeV^{22} + 4.2476×10^{-10} c3p^2 MWIMP qGeV^{22} +

23.9674 c4n^2 MWIMP qGeV^{22} − 0.149074 c1n c2n MWIMP^2 qGeV^{22} −

2.15716×10^{-8} c1p c2n MWIMP^2 qGeV^{22} − 5.68131×10^{-6} c2n^2 MWIMP^2 qGeV^{22} −

2.15716×10^{-8} c1n c2p MWIMP^2 qGeV^{22} − 3.15931×10^{-15} c1p c2p MWIMP^2 qGeV^{22} −

9.7571×10^{-7} c2n c2p MWIMP^2 qGeV^{22} − 1.40834×10^{-13} c2p^2 MWIMP^2 qGeV^{22} −

0.00627289 c2n c3n MWIMP^2 qGeV^{22} − 9.06088×10^{-10} c2p c3n MWIMP^2 qGeV^{22} −

0.0000335352 c3n^2 MWIMP^2 qGeV^{22} − 9.06088×10^{-10} c2n c3p MWIMP^2 qGeV^{22} −

1.29687×10^{-16} c2p c3p MWIMP^2 qGeV^{22} + 9.58799×10^{-7} c3n c3p MWIMP^2 qGeV^{22} +

1.72788×10^{-12} c3p^2 MWIMP^2 qGeV^{22} + 0.0974969 c4n^2 MWIMP^2 qGeV^{22} +

0.111806 c2n^2 qGeV^{24} + 3.23574×10^{-8} c2n c2p qGeV^{24} + 2.36948×10^{-15} c2p^2 qGeV^{24} −

0.0229249 c3n^2 qGeV^{24} − 8.36985×10^{-8} c3n c3p qGeV^{24} −

7.75304×10^{-14} c3p^2 qGeV^{24} − 319.783 c4n^2 qGeV^{24} + $\dfrac{281.522\ \text{c2n}^2\ \text{qGeV}^{24}}{\text{MWIMP}^2}$ +

$\dfrac{0.0000814747\ \text{c2n c2p qGeV}^{24}}{\text{MWIMP}^2}$ + $\dfrac{5.96626 \times 10^{-12}\ \text{c2p}^2\ \text{qGeV}^{24}}{\text{MWIMP}^2}$ +

$\dfrac{9.16162\ \text{c2n}^2\ \text{qGeV}^{24}}{\text{MWIMP}}$ + $\dfrac{2.65144 \times 10^{-6}\ \text{c2n c2p qGeV}^{24}}{\text{MWIMP}}$ + $\dfrac{1.94161 \times 10^{-13}\ \text{c2p}^2\ \text{qGeV}^{24}}{\text{MWIMP}}$ +

0.000606418 c2n^2 MWIMP qGeV^{24} + 1.75502×10^{-10} c2n c2p MWIMP qGeV^{24} +

1.28517×10^{-17} c2p^2 MWIMP qGeV^{24} − 0.000373024 c3n^2 MWIMP qGeV^{24} −

1.36191×10^{-9} c3n c3p MWIMP qGeV^{24} − 1.26154×10^{-15} c3p^2 MWIMP qGeV^{24} −

5.20337 c4n^2 MWIMP qGeV^{24} + 1.23342×10^{-6} c2n^2 MWIMP^2 qGeV^{24} +

3.56962×10^{-13} c2n c2p MWIMP^2 qGeV^{24} + 2.61398×10^{-20} c2p^2 MWIMP^2 qGeV^{24} −

1.51742×10^{-6} c3n^2 MWIMP^2 qGeV^{24} − 5.5401×10^{-12} c3n c3p MWIMP^2 qGeV^{24} −

5.13183×10^{-18} c3p^2 MWIMP^2 qGeV^{24} − 0.0211668 c4n^2 MWIMP^2 qGeV^{24} $\Bigg)$

$\left(\text{Erf}\left[1.05455 - \dfrac{5.54336\ (122.914\ \text{GeV} + \text{GeV MWIMP})\ \text{qGeV}}{\text{GeV MWIMP}} \right] + \right.$

$\left. \text{Erf}\left[1.05455 + \dfrac{5.54336\ (122.914\ \text{GeV} + \text{GeV MWIMP})\ \text{qGeV}}{\text{GeV MWIMP}} \right] \right) +$

$0.000733832\ e^{-67.4762\ \text{qGeV}^2} \left(0.0000454546\ \text{c1n c2n MWIMP}^2 + 0.0000318793\ \text{c1p c2n MWIMP}^2 + \right.$

$0.0000318793\ \text{c1n c2p MWIMP}^2 + 0.0000223583\ \text{c1p c2p MWIMP}^2 -$

$0.0000113637\,c2n^2\,qGeV^2 - 0.0000159397\,c2n\,c2p\,qGeV^2 - 5.58958\times10^{-6}\,c2p^2\,qGeV^2 -$
$1.84905\times10^{-7}\,c2n^2\,MWIMP\,qGeV^2 - 2.59363\times10^{-7}\,c2n\,c2p\,MWIMP\,qGeV^2 -$
$9.09514\times10^{-8}\,c2p^2\,MWIMP\,qGeV^2 - 0.00653239\,c1n\,c2n\,MWIMP^2\,qGeV^2 -$
$0.00422936\,c1p\,c2n\,MWIMP^2\,qGeV^2 + 4.12168\times10^{-9}\,c2n^2\,MWIMP^2\,qGeV^2 -$
$0.00422936\,c1n\,c2p\,MWIMP^2\,qGeV^2 - 0.0027193\,c1p\,c2p\,MWIMP^2\,qGeV^2 +$
$8.93375\times10^{-10}\,c2n\,c2p\,MWIMP^2\,qGeV^2 - 1.75247\times10^{-10}\,c2p^2\,MWIMP^2\,qGeV^2 -$
$4.75946\times10^{-6}\,c2n\,c3n\,MWIMP^2\,qGeV^2 - 3.33733\times10^{-6}\,c2p\,c3n\,MWIMP^2\,qGeV^2 +$
$9.56352\times10^{-11}\,c3n^2\,MWIMP^2\,qGeV^2 - 3.43236\times10^{-6}\,c2n\,c3p\,MWIMP^2\,qGeV^2 -$
$2.40725\times10^{-6}\,c2p\,c3p\,MWIMP^2\,qGeV^2 + 4.91055\times10^{-12}\,c3n\,c3p\,MWIMP^2\,qGeV^2 +$
$6.30352\times10^{-14}\,c3p^2\,MWIMP^2\,qGeV^2 + 6.45402\times10^{-6}\,c4n^2\,MWIMP^2\,qGeV^2 +$
$0.0016331\,c2n^2\,qGeV^4 + 0.00211468\,c2n\,c2p\,qGeV^4 + 0.000679825\,c2p^2\,qGeV^4 +$
$0.0000265731\,c2n^2\,MWIMP\,qGeV^4 + 0.0000344092\,c2n\,c2p\,MWIMP\,qGeV^4 +$
$0.0000110618\,c2p^2\,MWIMP\,qGeV^4 + 0.372815\,c1n\,c2n\,MWIMP^2\,qGeV^4 +$
$0.219895\,c1p\,c2n\,MWIMP^2\,qGeV^4 - 3.145\times10^{-7}\,c2n^2\,MWIMP^2\,qGeV^4 +$
$0.219895\,c1n\,c2p\,MWIMP^2\,qGeV^4 + 0.127789\,c1p\,c2p\,MWIMP^2\,qGeV^4 -$
$2.33825\times10^{-8}\,c2n\,c2p\,MWIMP^2\,qGeV^4 + 2.92305\times10^{-8}\,c2p^2\,MWIMP^2\,qGeV^4 +$
$0.0005954\,c2n\,c3n\,MWIMP^2\,qGeV^4 + 0.000380584\,c2p\,c3n\,MWIMP^2\,qGeV^4 -$
$3.02601\times10^{-8}\,c3n^2\,MWIMP^2\,qGeV^4 + 0.000385559\,c2n\,c3p\,MWIMP^2\,qGeV^4 +$
$0.00024382\,c2p\,c3p\,MWIMP^2\,qGeV^4 - 1.41614\times10^{-9}\,c3n\,c3p\,MWIMP^2\,qGeV^4 -$
$1.64121\times10^{-11}\,c3p^2\,MWIMP^2\,qGeV^4 - 0.000927523\,c4n^2\,MWIMP^2\,qGeV^4 -$
$0.0932038\,c2n^2\,qGeV^6 - 0.109947\,c2n\,c2p\,qGeV^6 - 0.0319473\,c2p^2\,qGeV^6 -$
$0.00151657\,c2n^2\,MWIMP\,qGeV^6 - 0.00178902\,c2n\,c2p\,MWIMP\,qGeV^6 -$
$0.000519833\,c2p^2\,MWIMP\,qGeV^6 - 11.0082\,c1n\,c2n\,MWIMP^2\,qGeV^6 -$
$5.81187\,c1p\,c2n\,MWIMP^2\,qGeV^6 + 0.0000117158\,c2n^2\,MWIMP^2\,qGeV^6 -$
$5.81187\,c1n\,c2p\,MWIMP^2\,qGeV^6 - 2.98964\,c1p\,c2p\,MWIMP^2\,qGeV^6 -$
$1.12917\times10^{-6}\,c2n\,c2p\,MWIMP^2\,qGeV^6 - 1.594\times10^{-6}\,c2p^2\,MWIMP^2\,qGeV^6 -$
$0.0291829\,c2n\,c3n\,MWIMP^2\,qGeV^6 - 0.0167931\,c2p\,c3n\,MWIMP^2\,qGeV^6 +$
$3.56522\times10^{-6}\,c3n^2\,MWIMP^2\,qGeV^6 - 0.0166831\,c2n\,c3p\,MWIMP^2\,qGeV^6 -$
$0.00939528\,c2p\,c3p\,MWIMP^2\,qGeV^6 + 1.17423\times10^{-7}\,c3n\,c3p\,MWIMP^2\,qGeV^6 +$
$9.58388\times10^{-10}\,c3p^2\,MWIMP^2\,qGeV^6 + 0.0529354\,c4n^2\,MWIMP^2\,qGeV^6 +$
$2.75205\,c2n^2\,qGeV^8 + 2.90593\,c2n\,c2p\,qGeV^8 + 0.74741\,c2p^2\,qGeV^8 +$
$0.0447803\,c2n^2\,MWIMP\,qGeV^8 + 0.0472841\,c2n\,c2p\,MWIMP\,qGeV^8 +$
$0.0121615\,c2p^2\,MWIMP\,qGeV^8 + 185.752\,c1n\,c2n\,MWIMP^2\,qGeV^8 +$
$85.8965\,c1p\,c2n\,MWIMP^2\,qGeV^8 - 0.000240885\,c2n^2\,MWIMP^2\,qGeV^8 +$
$85.8965\,c1n\,c2p\,MWIMP^2\,qGeV^8 + 38.1098\,c1p\,c2p\,MWIMP^2\,qGeV^8 +$
$0.0000669857\,c2n\,c2p\,MWIMP^2\,qGeV^8 + 0.0000406512\,c2p^2\,MWIMP^2\,qGeV^8 +$
$0.729568\,c2n\,c3n\,MWIMP^2\,qGeV^8 + 0.370353\,c2p\,c3n\,MWIMP^2\,qGeV^8 -$
$0.000202873\,c3n^2\,MWIMP^2\,qGeV^8 + 0.363455\,c2n\,c3p\,MWIMP^2\,qGeV^8 +$
$0.178189\,c2p\,c3p\,MWIMP^2\,qGeV^8 - 1.57188\times10^{-6}\,c3n\,c3p\,MWIMP^2\,qGeV^8 +$
$3.12783\times10^{-8}\,c3p^2\,MWIMP^2\,qGeV^8 - 1.56304\,c4n^2\,MWIMP^2\,qGeV^8 - 46.4379\,c2n^2\,qGeV^{10} -$
$42.9482\,c2n\,c2p\,qGeV^{10} - 9.52744\,c2p^2\,qGeV^{10} - 0.755619\,c2n^2\,MWIMP\,qGeV^{10} -$
$0.698836\,c2n\,c2p\,MWIMP\,qGeV^{10} - 0.155027\,c2p^2\,MWIMP\,qGeV^{10} -$
$1860.16\,c1n\,c2n\,MWIMP^2\,qGeV^{10} - 732.247\,c1p\,c2n\,MWIMP^2\,qGeV^{10} +$
$0.00271943\,c2n^2\,MWIMP^2\,qGeV^{10} - 732.247\,c1n\,c2p\,MWIMP^2\,qGeV^{10} -$
$270.493\,c1p\,c2p\,MWIMP^2\,qGeV^{10} - 0.00144387\,c2n\,c2p\,MWIMP^2\,qGeV^{10} -$
$0.0005503\,c2p^2\,MWIMP^2\,qGeV^{10} - 10.2428\,c2n\,c3n\,MWIMP^2\,qGeV^{10} -$
$4.47351\,c2p\,c3n\,MWIMP^2\,qGeV^{10} + 0.00642607\,c3n^2\,MWIMP^2\,qGeV^{10} -$
$4.35472\,c2n\,c3p\,MWIMP^2\,qGeV^{10} - 1.8018\,c2p\,c3p\,MWIMP^2\,qGeV^{10} -$
$0.000109198\,c3n\,c3p\,MWIMP^2\,qGeV^{10} - 4.88439\times10^{-7}\,c3p^2\,MWIMP^2\,qGeV^{10} +$
$26.3746\,c4n^2\,MWIMP^2\,qGeV^{10} + 465.04\,c2n^2\,qGeV^{12} + 366.123\,c2n\,c2p\,qGeV^{12} +$
$67.6233\,c2p^2\,qGeV^{12} + 7.56694\,c2n^2\,MWIMP\,qGeV^{12} + 5.95741\,c2n\,c2p\,MWIMP\,qGeV^{12} +$
$1.10034\,c2p^2\,MWIMP\,qGeV^{12} + 11038.5\,c1n\,c2n\,MWIMP^2\,qGeV^{12} +$
$3552.73\,c1p\,c2n\,MWIMP^2\,qGeV^{12} - 0.0103186\,c2n^2\,MWIMP^2\,qGeV^{12} +$
$3552.73\,c1n\,c2p\,MWIMP^2\,qGeV^{12} + 1038.52\,c1p\,c2p\,MWIMP^2\,qGeV^{12} +$

$0.0162741\,\text{c2n}\,\text{c2p}\,\text{MWIMP}^2\,\text{qGeV}^{12} + 0.00410417\,\text{c2p}^2\,\text{MWIMP}^2\,\text{qGeV}^{12} + 83.4457\,\text{c2n}\,\text{c3n}\,\text{MWIMP}^2\,\text{qGeV}^{12} + 30.3189\,\text{c2p}\,\text{c3n}\,\text{MWIMP}^2\,\text{qGeV}^{12} - 0.115495\,\text{c3n}^2\,\text{MWIMP}^2\,\text{qGeV}^{12} + 29.167\,\text{c2n}\,\text{c3p}\,\text{MWIMP}^2\,\text{qGeV}^{12} + 9.71259\,\text{c2p}\,\text{c3p}\,\text{MWIMP}^2\,\text{qGeV}^{12} + 0.00415673\,\text{c3n}\,\text{c3p}\,\text{MWIMP}^2\,\text{qGeV}^{12} - 0.0000282281\,\text{c3p}^2\,\text{MWIMP}^2\,\text{qGeV}^{12} - 264.121\,\text{c4n}^2\,\text{MWIMP}^2\,\text{qGeV}^{12} - 2759.62\,\text{c2n}^2\,\text{qGeV}^{14} - 1776.36\,\text{c2n}\,\text{c2p}\,\text{qGeV}^{14} - 259.631\,\text{c2p}^2\,\text{qGeV}^{14} - 44.9033\,\text{c2n}^2\,\text{MWIMP}\,\text{qGeV}^{14} - 28.9043\,\text{c2n}\,\text{c2p}\,\text{MWIMP}\,\text{qGeV}^{14} - 4.22461\,\text{c2p}^2\,\text{MWIMP}\,\text{qGeV}^{14} - 37134.8\,\text{c1n}\,\text{c2n}\,\text{MWIMP}^2\,\text{qGeV}^{14} - 9174.3\,\text{c1p}\,\text{c2n}\,\text{MWIMP}^2\,\text{qGeV}^{14} - 0.0583703\,\text{c2n}^2\,\text{MWIMP}^2\,\text{qGeV}^{14} - 9174.3\,\text{c1n}\,\text{c2p}\,\text{MWIMP}^2\,\text{qGeV}^{14} - 1956.51\,\text{c1p}\,\text{c2p}\,\text{MWIMP}^2\,\text{qGeV}^{14} - 0.098799\,\text{c2n}\,\text{c2p}\,\text{MWIMP}^2\,\text{qGeV}^{14} - 0.0164981\,\text{c2p}^2\,\text{MWIMP}^2\,\text{qGeV}^{14} - 390.228\,\text{c2n}\,\text{c3n}\,\text{MWIMP}^2\,\text{qGeV}^{14} - 112.472\,\text{c2p}\,\text{c3n}\,\text{MWIMP}^2\,\text{qGeV}^{14} + 1.14906\,\text{c3n}^2\,\text{MWIMP}^2\,\text{qGeV}^{14} - 104.016\,\text{c2n}\,\text{c3p}\,\text{MWIMP}^2\,\text{qGeV}^{14} - 25.6419\,\text{c2p}\,\text{c3p}\,\text{MWIMP}^2\,\text{qGeV}^{14} - 0.0556024\,\text{c3n}\,\text{c3p}\,\text{MWIMP}^2\,\text{qGeV}^{14} + 0.000642841\,\text{c3p}^2\,\text{MWIMP}^2\,\text{qGeV}^{14} + 1567.33\,\text{c4n}^2\,\text{MWIMP}^2\,\text{qGeV}^{14} + 9283.69\,\text{c2n}^2\,\text{qGeV}^{16} + 4587.15\,\text{c2n}\,\text{c2p}\,\text{qGeV}^{16} + 489.126\,\text{c2p}^2\,\text{qGeV}^{16} + 151.06\,\text{c2n}^2\,\text{MWIMP}\,\text{qGeV}^{16} + 74.6402\,\text{c2n}\,\text{c2p}\,\text{MWIMP}\,\text{qGeV}^{16} + 7.95886\,\text{c2p}^2\,\text{MWIMP}\,\text{qGeV}^{16} + 63149.8\,\text{c1n}\,\text{c2n}\,\text{MWIMP}^2\,\text{qGeV}^{16} + 10672.\,\text{c1p}\,\text{c2n}\,\text{MWIMP}^2\,\text{qGeV}^{16} + 0.550251\,\text{c2n}^2\,\text{MWIMP}^2\,\text{qGeV}^{16} + 10672.\,\text{c1n}\,\text{c2p}\,\text{MWIMP}^2\,\text{qGeV}^{16} + 1410.09\,\text{c1p}\,\text{c2p}\,\text{MWIMP}^2\,\text{qGeV}^{16} + 0.298602\,\text{c2n}\,\text{c2p}\,\text{MWIMP}^2\,\text{qGeV}^{16} + 0.0323758\,\text{c2p}^2\,\text{MWIMP}^2\,\text{qGeV}^{16} + 983.829\,\text{c2n}\,\text{c3n}\,\text{MWIMP}^2\,\text{qGeV}^{16} + 208.461\,\text{c2p}\,\text{c3n}\,\text{MWIMP}^2\,\text{qGeV}^{16} - 5.80573\,\text{c3n}^2\,\text{MWIMP}^2\,\text{qGeV}^{16} + 167.069\,\text{c2n}\,\text{c3p}\,\text{MWIMP}^2\,\text{qGeV}^{16} + 24.9044\,\text{c2p}\,\text{c3p}\,\text{MWIMP}^2\,\text{qGeV}^{16} + 0.317557\,\text{c3n}\,\text{c3p}\,\text{MWIMP}^2\,\text{qGeV}^{16} - 0.00431187\,\text{c3p}^2\,\text{MWIMP}^2\,\text{qGeV}^{16} - 5272.7\,\text{c4n}^2\,\text{MWIMP}^2\,\text{qGeV}^{16} - 15787.4\,\text{c2n}^2\,\text{qGeV}^{18} - 5335.99\,\text{c2n}\,\text{c2p}\,\text{qGeV}^{18} - 352.521\,\text{c2p}^2\,\text{qGeV}^{18} - 256.887\,\text{c2n}^2\,\text{MWIMP}\,\text{qGeV}^{18} - 86.8251\,\text{c2n}\,\text{c2p}\,\text{MWIMP}\,\text{qGeV}^{18} - 5.73608\,\text{c2p}^2\,\text{MWIMP}\,\text{qGeV}^{18} - 41495.2\,\text{c1n}\,\text{c2n}\,\text{MWIMP}^2\,\text{qGeV}^{18} - 3563.21\,\text{c1p}\,\text{c2n}\,\text{MWIMP}^2\,\text{qGeV}^{18} - 1.03577\,\text{c2n}^2\,\text{MWIMP}^2\,\text{qGeV}^{18} - 3563.21\,\text{c1n}\,\text{c2p}\,\text{MWIMP}^2\,\text{qGeV}^{18} - 0.00102863\,\text{c1p}\,\text{c2p}\,\text{MWIMP}^2\,\text{qGeV}^{18} - 0.353195\,\text{c2n}\,\text{c2p}\,\text{MWIMP}^2\,\text{qGeV}^{18} - 0.0233338\,\text{c2p}^2\,\text{MWIMP}^2\,\text{qGeV}^{18} - 1137.08\,\text{c2n}\,\text{c3n}\,\text{MWIMP}^2\,\text{qGeV}^{18} - 149.943\,\text{c2p}\,\text{c3n}\,\text{MWIMP}^2\,\text{qGeV}^{18} + 11.348\,\text{c3n}^2\,\text{MWIMP}^2\,\text{qGeV}^{18} - 63.1253\,\text{c2n}\,\text{c3p}\,\text{MWIMP}^2\,\text{qGeV}^{18} - 0.0000308358\,\text{c2p}\,\text{c3p}\,\text{MWIMP}^2\,\text{qGeV}^{18} - 0.643307\,\text{c3n}\,\text{c3p}\,\text{MWIMP}^2\,\text{qGeV}^{18} + 0.00925579\,\text{c3p}^2\,\text{MWIMP}^2\,\text{qGeV}^{18} + 8966.53\,\text{c4n}^2\,\text{MWIMP}^2\,\text{qGeV}^{18} + 10373.8\,\text{c2n}^2\,\text{qGeV}^{20} + 1781.6\,\text{c2n}\,\text{c2p}\,\text{qGeV}^{20} + 0.000257157\,\text{c2p}^2\,\text{qGeV}^{20} + 168.798\,\text{c2n}^2\,\text{MWIMP}\,\text{qGeV}^{20} + 28.9895\,\text{c2n}\,\text{c2p}\,\text{MWIMP}\,\text{qGeV}^{20} + 4.18435\times10^{-6}\,\text{c2p}^2\,\text{MWIMP}\,\text{qGeV}^{20} + 9008.71\,\text{c1n}\,\text{c2n}\,\text{MWIMP}^2\,\text{qGeV}^{20} + 0.00130359\,\text{c1p}\,\text{c2n}\,\text{MWIMP}^2\,\text{qGeV}^{20} + 0.686654\,\text{c2n}^2\,\text{MWIMP}^2\,\text{qGeV}^{20} + 0.00130359\,\text{c1n}\,\text{c2p}\,\text{MWIMP}^2\,\text{qGeV}^{20} + 1.9092\times10^{-10}\,\text{c1p}\,\text{c2p}\,\text{MWIMP}^2\,\text{qGeV}^{20} + 0.117926\,\text{c2n}\,\text{c2p}\,\text{MWIMP}^2\,\text{qGeV}^{20} + 1.70215\times10^{-8}\,\text{c2p}^2\,\text{MWIMP}^2\,\text{qGeV}^{20} + 379.077\,\text{c2n}\,\text{c3n}\,\text{MWIMP}^2\,\text{qGeV}^{20} + 0.0000547559\,\text{c2p}\,\text{c3n}\,\text{MWIMP}^2\,\text{qGeV}^{20} + 2.02657\,\text{c3n}^2\,\text{MWIMP}^2\,\text{qGeV}^{20} + 0.0000547559\,\text{c2n}\,\text{c3p}\,\text{MWIMP}^2\,\text{qGeV}^{20} + 7.83714\times10^{-12}\,\text{c2p}\,\text{c3p}\,\text{MWIMP}^2\,\text{qGeV}^{20} - 0.0579412\,\text{c3n}\,\text{c3p}\,\text{MWIMP}^2\,\text{qGeV}^{20} - 1.04417\times10^{-7}\,\text{c3p}^2\,\text{MWIMP}^2\,\text{qGeV}^{20} - 5891.84\,\text{c4n}^2\,\text{MWIMP}^2\,\text{qGeV}^{20} - 2252.18\,\text{c2n}^2\,\text{qGeV}^{22} - 0.000651797\,\text{c2n}\,\text{c2p}\,\text{qGeV}^{22} - 4.77301\times10^{-11}\,\text{c2p}^2\,\text{qGeV}^{22} - 36.6465\,\text{c2n}^2\,\text{MWIMP}\,\text{qGeV}^{22} - 0.0000106058\,\text{c2n}\,\text{c2p}\,\text{MWIMP}\,\text{qGeV}^{22} - 7.76645\times10^{-13}\,\text{c2p}^2\,\text{MWIMP}\,\text{qGeV}^{22} - 0.149074\,\text{c2n}^2\,\text{MWIMP}^2\,\text{qGeV}^{22} - 4.31432\times10^{-8}\,\text{c2n}\,\text{c2p}\,\text{MWIMP}^2\,\text{qGeV}^{22} - 3.15931\times10^{-15}\,\text{c2p}^2\,\text{MWIMP}^2\,\text{qGeV}^{22} + 0.0916995\,\text{c3n}^2\,\text{MWIMP}^2\,\text{qGeV}^{22} + 3.34794\times10^{-7}\,\text{c3n}\,\text{c3p}\,\text{MWIMP}^2\,\text{qGeV}^{22} + 3.10122\times10^{-13}\,\text{c3p}^2\,\text{MWIMP}^2\,\text{qGeV}^{22} + 1279.13\,\text{c4n}^2\,\text{MWIMP}^2\,\text{qGeV}^{22}\Big)$

$\left(0.267504\left(-e^{-\left(1.05455 + \frac{5.54336\,(122.914\,\text{GeV} + \text{GeV}\,\text{MWIMP})\,\text{qGeV}}{\text{GeV}\,\text{MWIMP}}\right)^2}\right.\right.$

$$\left(-1.05455 + \frac{5.54336\,(122.914\,\text{GeV} + \text{GeV MWIMP})\,\text{qGeV}}{\text{GeV MWIMP}}\right) +$$

$$\mathbb{e}^{-\left(1.05455 - \frac{5.54336\,(122.914\,\text{GeV} + \text{GeV MWIMP})\,\text{qGeV}}{\text{GeV MWIMP}}\right)^2}$$

$$\left(1.05455 + \frac{5.54336\,(122.914\,\text{GeV} + \text{GeV MWIMP})\,\text{qGeV}}{\text{GeV MWIMP}}\right)\right) +$$

$$0.764342\left(\text{Erf}\left[1.05455 - \frac{5.54336\,(122.914\,\text{GeV} + \text{GeV MWIMP})\,\text{qGeV}}{\text{GeV MWIMP}}\right] +\right.$$

$$\left.\text{Erf}\left[1.05455 + \frac{5.54336\,(122.914\,\text{GeV} + \text{GeV MWIMP})\,\text{qGeV}}{\text{GeV MWIMP}}\right]\right)\right)\right)$$

In[439]:= **dRdEsimp = Simplify[dRdE, {Element [GeV, Reals], GeV > 0,**
Element [MWIMP, Reals], MWIMP > 0, Element [qGeV, Reals], qGeV > 0}]

Out[439]= $\dfrac{1}{\text{GeV MWIMP}^5}\,2.6053\times10^{-44}\,\mathbb{e}^{-67.4762\,\text{qGeV}^2}$

$\left(2.91032\times10^6\,\left(9.23994\times10^{-18}\,\text{c4p}^2\,\text{MWIMP}^4 + 1.94565\times10^{-15}\,\text{c4n c4p MWIMP}^4\,\text{qGeV}^2 -\right.\right.$

$1.6626\times10^{-15}\,\text{c4p}^2\,\text{MWIMP}^4\,\text{qGeV}^2 + 3.15352\times10^{-10}\,\text{c2n}^2\,\text{qGeV}^4 +$

$4.4234\times10^{-10}\,\text{c2n c2p qGeV}^4 + 1.55116\times10^{-10}\,\text{c2p}^2\,\text{qGeV}^4 +$

$1.02626\times10^{-11}\,\text{c2n}^2\,\text{MWIMP qGeV}^4 + 1.43952\times10^{-11}\,\text{c2n c2p MWIMP qGeV}^4 +$

$5.04797\times10^{-12}\,\text{c2p}^2\,\text{MWIMP qGeV}^4 - 1.45267\times10^{-13}\,\text{c2n}^2\,\text{MWIMP}^2\,\text{qGeV}^4 +$

$6.7532\times10^{-14}\,\text{c2n c2p MWIMP}^2\,\text{qGeV}^4 + 5.07958\times10^{-14}\,\text{c2p}^2\,\text{MWIMP}^2\,\text{qGeV}^4 +$

$2.64159\times10^{-10}\,\text{c2n c3n MWIMP}^2\,\text{qGeV}^4 + 1.85228\times10^{-10}\,\text{c2p c3n MWIMP}^2\,\text{qGeV}^4 -$

$5.30793\times10^{-15}\,\text{c3n}^2\,\text{MWIMP}^2\,\text{qGeV}^4 + 1.90502\times10^{-10}\,\text{c2n c3p MWIMP}^2\,\text{qGeV}^4 +$

$1.33607\times10^{-10}\,\text{c2p c3p MWIMP}^2\,\text{qGeV}^4 - 2.72545\times10^{-16}\,\text{c3n c3p MWIMP}^2\,\text{qGeV}^4 -$

$3.49857\times10^{-18}\,\text{c3p}^2\,\text{MWIMP}^2\,\text{qGeV}^4 - 3.5821\times10^{-10}\,\text{c4n}^2\,\text{MWIMP}^2\,\text{qGeV}^4 -$

$3.7223\times10^{-15}\,\text{c2n}^2\,\text{MWIMP}^3\,\text{qGeV}^4 - 8.0681\times10^{-16}\,\text{c2n c2p MWIMP}^3\,\text{qGeV}^4 +$

$1.58266\times10^{-16}\,\text{c2p}^2\,\text{MWIMP}^3\,\text{qGeV}^4 + 4.29829\times10^{-12}\,\text{c2n c3n MWIMP}^3\,\text{qGeV}^4 +$

$3.01396\times10^{-12}\,\text{c2p c3n MWIMP}^3\,\text{qGeV}^4 - 8.63685\times10^{-17}\,\text{c3n}^2\,\text{MWIMP}^3\,\text{qGeV}^4 +$

$3.09978\times10^{-12}\,\text{c2n c3p MWIMP}^3\,\text{qGeV}^4 + 2.17399\times10^{-12}\,\text{c2p c3p MWIMP}^3\,\text{qGeV}^4 -$

$4.43474\times10^{-18}\,\text{c3n c3p MWIMP}^3\,\text{qGeV}^4 - 5.69273\times10^{-20}\,\text{c3p}^2\,\text{MWIMP}^3\,\text{qGeV}^4 -$

$5.82865\times10^{-12}\,\text{c4n}^2\,\text{MWIMP}^3\,\text{qGeV}^4 - 1.65236\times10^{-17}\,\text{c2n}^2\,\text{MWIMP}^4\,\text{qGeV}^4 -$

$5.22003\times10^{-18}\,\text{c2n c2p MWIMP}^4\,\text{qGeV}^4 - 3.57943\times10^{-20}\,\text{c2p}^2\,\text{MWIMP}^4\,\text{qGeV}^4 +$

$1.7485\times10^{-14}\,\text{c2n c3n MWIMP}^4\,\text{qGeV}^4 + 1.22605\times10^{-14}\,\text{c2p c3n MWIMP}^4\,\text{qGeV}^4 +$

$5.54409\times10^{-11}\,\text{c3n}^2\,\text{MWIMP}^4\,\text{qGeV}^4 + 1.26096\times10^{-14}\,\text{c2n c3p MWIMP}^4\,\text{qGeV}^4 +$

$8.84358\times10^{-15}\,\text{c2p c3p MWIMP}^4\,\text{qGeV}^4 + 7.97174\times10^{-11}\,\text{c3n c3p MWIMP}^4\,\text{qGeV}^4 +$

$2.87734\times10^{-11}\,\text{c3p}^2\,\text{MWIMP}^4\,\text{qGeV}^4 + 1.29925\times10^{-13}\,\text{c4n}^2\,\text{MWIMP}^4\,\text{qGeV}^4 -$

$3.3764\times10^{-13}\,\text{c4n c4p MWIMP}^4\,\text{qGeV}^4 + 1.0137\times10^{-13}\,\text{c4p}^2\,\text{MWIMP}^4\,\text{qGeV}^4 -$

$4.532\times10^{-8}\,\text{c2n}^2\,\text{qGeV}^6 - 5.86844\times10^{-8}\,\text{c2n c2p qGeV}^6 - 1.88658\times10^{-8}\,\text{c2p}^2\,\text{qGeV}^6 -$

$1.47486\times10^{-9}\,\text{c2n}^2\,\text{MWIMP qGeV}^6 - 1.90978\times10^{-9}\,\text{c2n c2p MWIMP qGeV}^6 -$

$6.13952\times10^{-10}\,\text{c2p}^2\,\text{MWIMP qGeV}^6 + 5.45622\times10^{-12}\,\text{c2n}^2\,\text{MWIMP}^2\,\text{qGeV}^6 -$

$1.42398\times10^{-11}\,\text{c2n c2p MWIMP}^2\,\text{qGeV}^6 - 6.61734\times10^{-12}\,\text{c2p}^2\,\text{MWIMP}^2\,\text{qGeV}^6 -$

$3.30458\times10^{-8}\,\text{c2n c3n MWIMP}^2\,\text{qGeV}^6 - 2.11231\times10^{-8}\,\text{c2p c3n MWIMP}^2\,\text{qGeV}^6 +$

$1.67949\times10^{-12}\,\text{c3n}^2\,\text{MWIMP}^2\,\text{qGeV}^6 - 2.13992\times10^{-8}\,\text{c2n c3p MWIMP}^2\,\text{qGeV}^6 -$

$1.35324\times10^{-8}\,\text{c2p c3p MWIMP}^2\,\text{qGeV}^6 + 7.85986\times10^{-14}\,\text{c3n c3p MWIMP}^2\,\text{qGeV}^6 +$

$9.10901\times10^{-16}\,\text{c3p}^2\,\text{MWIMP}^2\,\text{qGeV}^6 + 5.14793\times10^{-8}\,\text{c4n}^2\,\text{MWIMP}^2\,\text{qGeV}^6 +$

$2.84026\times10^{-13}\,\text{c2n}^2\,\text{MWIMP}^3\,\text{qGeV}^6 + 2.11168\times10^{-14}\,\text{c2n c2p MWIMP}^3\,\text{qGeV}^6 -$

$2.63982\times10^{-14}\,\text{c2p}^2\,\text{MWIMP}^3\,\text{qGeV}^6 - 5.37708\times10^{-10}\,\text{c2n c3n MWIMP}^3\,\text{qGeV}^6 -$

$3.43706\times10^{-10}\,\text{c2p c3n MWIMP}^3\,\text{qGeV}^6 + 2.7328\times10^{-14}\,\text{c3n}^2\,\text{MWIMP}^3\,\text{qGeV}^6 -$

$3.48199\times10^{-10}\,\text{c2n c3p MWIMP}^3\,\text{qGeV}^6 - 2.20194\times10^{-10}\,\text{c2p c3p MWIMP}^3\,\text{qGeV}^6 +$

$1.27892\times10^{-15}\,\text{c3n c3p MWIMP}^3\,\text{qGeV}^6 + 1.48218\times10^{-17}\,\text{c3p}^2\,\text{MWIMP}^3\,\text{qGeV}^6 +$

$8.37649\times10^{-10}\,\text{c4n}^2\,\text{MWIMP}^3\,\text{qGeV}^6 + 1.35395\times10^{-15}\,\text{c2n}^2\,\text{MWIMP}^4\,\text{qGeV}^6 +$

$3.43013 \times 10^{-16} \, \text{c2n} \, \text{c2p} \, \text{MWIMP}^4 \, \text{qGeV}^6 - 2.4729 \times 10^{-17} \, \text{c2p}^2 \, \text{MWIMP}^4 \, \text{qGeV}^6 -$
$2.18734 \times 10^{-12} \, \text{c2n} \, \text{c3n} \, \text{MWIMP}^4 \, \text{qGeV}^6 - 1.39816 \times 10^{-12} \, \text{c2p} \, \text{c3n} \, \text{MWIMP}^4 \, \text{qGeV}^6 -$
$5.89954 \times 10^{-9} \, \text{c3n}^2 \, \text{MWIMP}^4 \, \text{qGeV}^6 - 1.41644 \times 10^{-12} \, \text{c2n} \, \text{c3p} \, \text{MWIMP}^4 \, \text{qGeV}^6 -$
$8.95728 \times 10^{-13} \, \text{c2p} \, \text{c3p} \, \text{MWIMP}^4 \, \text{qGeV}^6 - 7.45696 \times 10^{-9} \, \text{c3n} \, \text{c3p} \, \text{MWIMP}^4 \, \text{qGeV}^6 -$
$2.33103 \times 10^{-9} \, \text{c3p}^2 \, \text{MWIMP}^4 \, \text{qGeV}^6 - 9.91382 \times 10^{-12} \, \text{c4n}^2 \, \text{MWIMP}^4 \, \text{qGeV}^6 +$
$7.37573 \times 10^{-12} \, \text{c4n} \, \text{c4p} \, \text{MWIMP}^4 \, \text{qGeV}^6 + 1.78062 \times 10^{-12} \, \text{c4p}^2 \, \text{MWIMP}^4 \, \text{qGeV}^6 +$
$2.58649 \times 10^{-6} \, \text{c2n}^2 \, \text{qGeV}^8 + 3.05114 \times 10^{-6} \, \text{c2n} \, \text{c2p} \, \text{qGeV}^8 +$
$8.86567 \times 10^{-7} \, \text{c2p}^2 \, \text{qGeV}^8 + 8.41726 \times 10^{-8} \, \text{c2n}^2 \, \text{MWIMP} \, \text{qGeV}^8 +$
$9.92938 \times 10^{-8} \, \text{c2n} \, \text{c2p} \, \text{MWIMP} \, \text{qGeV}^8 + 2.88517 \times 10^{-8} \, \text{c2p}^2 \, \text{MWIMP} \, \text{qGeV}^8 +$
$3.45618 \times 10^{-11} \, \text{c2n}^2 \, \text{MWIMP}^2 \, \text{qGeV}^8 + 8.70505 \times 10^{-10} \, \text{c2n} \, \text{c2p} \, \text{MWIMP}^2 \, \text{qGeV}^8 +$
$3.23202 \times 10^{-10} \, \text{c2p}^2 \, \text{MWIMP}^2 \, \text{qGeV}^8 + 1.6197 \times 10^{-6} \, \text{c2n} \, \text{c3n} \, \text{MWIMP}^2 \, \text{qGeV}^8 +$
$9.32049 \times 10^{-7} \, \text{c2p} \, \text{c3n} \, \text{MWIMP}^2 \, \text{qGeV}^8 - 1.97877 \times 10^{-10} \, \text{c3n}^2 \, \text{MWIMP}^2 \, \text{qGeV}^8 +$
$9.25944 \times 10^{-7} \, \text{c2n} \, \text{c3p} \, \text{MWIMP}^2 \, \text{qGeV}^8 + 5.21455 \times 10^{-7} \, \text{c2p} \, \text{c3p} \, \text{MWIMP}^2 \, \text{qGeV}^8 -$
$6.51718 \times 10^{-12} \, \text{c3n} \, \text{c3p} \, \text{MWIMP}^2 \, \text{qGeV}^8 - 5.31923 \times 10^{-14} \, \text{c3p}^2 \, \text{MWIMP}^2 \, \text{qGeV}^8 -$
$2.93801 \times 10^{-6} \, \text{c4n}^2 \, \text{MWIMP}^2 \, \text{qGeV}^8 - 1.05806 \times 10^{-11} \, \text{c2n}^2 \, \text{MWIMP}^3 \, \text{qGeV}^8 +$
$1.01976 \times 10^{-12} \, \text{c2n} \, \text{c2p} \, \text{MWIMP}^3 \, \text{qGeV}^8 + 1.43955 \times 10^{-12} \, \text{c2p}^2 \, \text{MWIMP}^3 \, \text{qGeV}^8 +$
$2.63552 \times 10^{-8} \, \text{c2n} \, \text{c3n} \, \text{MWIMP}^3 \, \text{qGeV}^8 + 1.51659 \times 10^{-8} \, \text{c2p} \, \text{c3n} \, \text{MWIMP}^3 \, \text{qGeV}^8 -$
$3.21977 \times 10^{-12} \, \text{c3n}^2 \, \text{MWIMP}^3 \, \text{qGeV}^8 + 1.50666 \times 10^{-8} \, \text{c2n} \, \text{c3p} \, \text{MWIMP}^3 \, \text{qGeV}^8 +$
$8.48491 \times 10^{-9} \, \text{c2p} \, \text{c3p} \, \text{MWIMP}^3 \, \text{qGeV}^8 - 1.06045 \times 10^{-13} \, \text{c3n} \, \text{c3p} \, \text{MWIMP}^3 \, \text{qGeV}^8 -$
$8.65524 \times 10^{-16} \, \text{c3p}^2 \, \text{MWIMP}^3 \, \text{qGeV}^8 - 4.78061 \times 10^{-8} \, \text{c4n}^2 \, \text{MWIMP}^3 \, \text{qGeV}^8 -$
$5.43729 \times 10^{-14} \, \text{c2n}^2 \, \text{MWIMP}^4 \, \text{qGeV}^8 - 9.21958 \times 10^{-15} \, \text{c2n} \, \text{c2p} \, \text{MWIMP}^4 \, \text{qGeV}^8 +$
$1.97164 \times 10^{-15} \, \text{c2p}^2 \, \text{MWIMP}^4 \, \text{qGeV}^8 + 1.0721 \times 10^{-10} \, \text{c2n} \, \text{c3n} \, \text{MWIMP}^4 \, \text{qGeV}^8 +$
$6.16934 \times 10^{-11} \, \text{c2p} \, \text{c3n} \, \text{MWIMP}^4 \, \text{qGeV}^8 + 2.44037 \times 10^{-7} \, \text{c3n}^2 \, \text{MWIMP}^4 \, \text{qGeV}^8 +$
$6.12893 \times 10^{-11} \, \text{c2n} \, \text{c3p} \, \text{MWIMP}^4 \, \text{qGeV}^8 + 3.45157 \times 10^{-11} \, \text{c2p} \, \text{c3p} \, \text{MWIMP}^4 \, \text{qGeV}^8 +$
$2.68194 \times 10^{-7} \, \text{c3n} \, \text{c3p} \, \text{MWIMP}^4 \, \text{qGeV}^8 + 7.23893 \times 10^{-8} \, \text{c3p}^2 \, \text{MWIMP}^4 \, \text{qGeV}^8 +$
$3.69311 \times 10^{-10} \, \text{c4n}^2 \, \text{MWIMP}^4 \, \text{qGeV}^8 + 1.85526 \times 10^{-10} \, \text{c4n} \, \text{c4p} \, \text{MWIMP}^4 \, \text{qGeV}^8 +$
$1.25994 \times 10^{-11} \, \text{c4p}^2 \, \text{MWIMP}^4 \, \text{qGeV}^8 - 0.0000763721 \, \text{c2n}^2 \, \text{qGeV}^{10} -$
$0.0000806424 \, \text{c2n} \, \text{c2p} \, \text{qGeV}^{10} - 0.0000207413 \, \text{c2p}^2 \, \text{qGeV}^{10} -$
$2.48539 \times 10^{-6} \, \text{c2n}^2 \, \text{MWIMP} \, \text{qGeV}^{10} - 2.62436 \times 10^{-6} \, \text{c2n} \, \text{c2p} \, \text{MWIMP} \, \text{qGeV}^{10} -$
$6.74988 \times 10^{-7} \, \text{c2p}^2 \, \text{MWIMP} \, \text{qGeV}^{10} - 6.85104 \times 10^{-9} \, \text{c2n}^2 \, \text{MWIMP}^2 \, \text{qGeV}^{10} -$
$2.50691 \times 10^{-8} \, \text{c2n} \, \text{c2p} \, \text{MWIMP}^2 \, \text{qGeV}^{10} - 7.74778 \times 10^{-9} \, \text{c2p}^2 \, \text{MWIMP}^2 \, \text{qGeV}^{10} -$
$0.0000404924 \, \text{c2n} \, \text{c3n} \, \text{MWIMP}^2 \, \text{qGeV}^{10} - 0.0000205553 \, \text{c2p} \, \text{c3n} \, \text{MWIMP}^2 \, \text{qGeV}^{10} +$
$1.12598 \times 10^{-8} \, \text{c3n}^2 \, \text{MWIMP}^2 \, \text{qGeV}^{10} - 0.0000201724 \, \text{c2n} \, \text{c3p} \, \text{MWIMP}^2 \, \text{qGeV}^{10} -$
$9.88984 \times 10^{-6} \, \text{c2p} \, \text{c3p} \, \text{MWIMP}^2 \, \text{qGeV}^{10} + 8.72425 \times 10^{-11} \, \text{c3n} \, \text{c3p} \, \text{MWIMP}^2 \, \text{qGeV}^{10} -$
$1.736 \times 10^{-12} \, \text{c3p}^2 \, \text{MWIMP}^2 \, \text{qGeV}^{10} + 0.0000867515 \, \text{c4n}^2 \, \text{MWIMP}^2 \, \text{qGeV}^{10} +$
$2.17544 \times 10^{-10} \, \text{c2n}^2 \, \text{MWIMP}^3 \, \text{qGeV}^{10} - 6.0495 \times 10^{-11} \, \text{c2n} \, \text{c2p} \, \text{MWIMP}^3 \, \text{qGeV}^{10} -$
$3.67123 \times 10^{-11} \, \text{c2p}^2 \, \text{MWIMP}^3 \, \text{qGeV}^{10} - 6.58876 \times 10^{-7} \, \text{c2n} \, \text{c3n} \, \text{MWIMP}^3 \, \text{qGeV}^{10} -$
$3.34467 \times 10^{-7} \, \text{c2p} \, \text{c3n} \, \text{MWIMP}^3 \, \text{qGeV}^{10} + 1.83215 \times 10^{-10} \, \text{c3n}^2 \, \text{MWIMP}^3 \, \text{qGeV}^{10} -$
$3.28237 \times 10^{-7} \, \text{c2n} \, \text{c3p} \, \text{MWIMP}^3 \, \text{qGeV}^{10} - 1.60923 \times 10^{-7} \, \text{c2p} \, \text{c3p} \, \text{MWIMP}^3 \, \text{qGeV}^{10} +$
$1.41957 \times 10^{-12} \, \text{c3n} \, \text{c3p} \, \text{MWIMP}^3 \, \text{qGeV}^{10} - 2.82475 \times 10^{-14} \, \text{c3p}^2 \, \text{MWIMP}^3 \, \text{qGeV}^{10} +$
$1.41158 \times 10^{-6} \, \text{c4n}^2 \, \text{MWIMP}^3 \, \text{qGeV}^{10} + 1.21955 \times 10^{-12} \, \text{c2n}^2 \, \text{MWIMP}^4 \, \text{qGeV}^{10} +$
$1.07228 \times 10^{-13} \, \text{c2n} \, \text{c2p} \, \text{MWIMP}^4 \, \text{qGeV}^{10} - 5.84685 \times 10^{-14} \, \text{c2p}^2 \, \text{MWIMP}^4 \, \text{qGeV}^{10} -$
$2.68024 \times 10^{-9} \, \text{c2n} \, \text{c3n} \, \text{MWIMP}^4 \, \text{qGeV}^{10} - 1.36058 \times 10^{-9} \, \text{c2p} \, \text{c3n} \, \text{MWIMP}^4 \, \text{qGeV}^{10} -$
$5.06927 \times 10^{-6} \, \text{c3n}^2 \, \text{MWIMP}^4 \, \text{qGeV}^{10} - 1.33524 \times 10^{-9} \, \text{c2n} \, \text{c3p} \, \text{MWIMP}^4 \, \text{qGeV}^{10} -$
$6.5462 \times 10^{-10} \, \text{c2p} \, \text{c3p} \, \text{MWIMP}^4 \, \text{qGeV}^{10} - 4.78225 \times 10^{-6} \, \text{c3n} \, \text{c3p} \, \text{MWIMP}^4 \, \text{qGeV}^{10} -$
$1.09322 \times 10^{-6} \, \text{c3p}^2 \, \text{MWIMP}^4 \, \text{qGeV}^{10} - 7.5933 \times 10^{-9} \, \text{c4n}^2 \, \text{MWIMP}^4 \, \text{qGeV}^{10} -$
$1.18755 \times 10^{-8} \, \text{c4n} \, \text{c4p} \, \text{MWIMP}^4 \, \text{qGeV}^{10} - 3.98774 \times 10^{-9} \, \text{c4p}^2 \, \text{MWIMP}^4 \, \text{qGeV}^{10} +$
$0.0012887 \, \text{c2n}^2 \, \text{qGeV}^{12} + 0.00119185 \, \text{c2n} \, \text{c2p} \, \text{qGeV}^{12} + 0.000264395 \, \text{c2p}^2 \, \text{qGeV}^{12} +$
$0.0000419383 \, \text{c2n}^2 \, \text{MWIMP} \, \text{qGeV}^{12} + 0.0000387867 \, \text{c2n} \, \text{c2p} \, \text{MWIMP} \, \text{qGeV}^{12} +$
$8.60427 \times 10^{-6} \, \text{c2p}^2 \, \text{MWIMP} \, \text{qGeV}^{12} + 1.90268 \times 10^{-7} \, \text{c2n}^2 \, \text{MWIMP}^2 \, \text{qGeV}^{12} +$
$3.95698 \times 10^{-7} \, \text{c2n} \, \text{c2p} \, \text{MWIMP}^2 \, \text{qGeV}^{12} + 1.00545 \times 10^{-7} \, \text{c2p}^2 \, \text{MWIMP}^2 \, \text{qGeV}^{12} +$
$0.000568492 \, \text{c2n} \, \text{c3n} \, \text{MWIMP}^2 \, \text{qGeV}^{12} + 0.000248288 \, \text{c2p} \, \text{c3n} \, \text{MWIMP}^2 \, \text{qGeV}^{12} -$
$3.56659 \times 10^{-7} \, \text{c3n}^2 \, \text{MWIMP}^2 \, \text{qGeV}^{12} + 0.000241695 \, \text{c2n} \, \text{c3p} \, \text{MWIMP}^2 \, \text{qGeV}^{12} +$
$0.000100003 \, \text{c2p} \, \text{c3p} \, \text{MWIMP}^2 \, \text{qGeV}^{12} + 6.0607 \times 10^{-9} \, \text{c3n} \, \text{c3p} \, \text{MWIMP}^2 \, \text{qGeV}^{12} +$

$2.71093 \times 10^{-11} \, c3p^2 \, MWIMP^2 \, qGeV^{12} - 0.00146384 \, c4n^2 \, MWIMP^2 \, qGeV^{12} -$
$2.45593 \times 10^{-9} \, c2n^2 \, MWIMP^3 \, qGeV^{12} + 1.30397 \times 10^{-9} \, c2n \, c2p \, MWIMP^3 \, qGeV^{12} +$
$4.96978 \times 10^{-10} \, c2p^2 \, MWIMP^3 \, qGeV^{12} + 9.25027 \times 10^{-6} \, c2n \, c3n \, MWIMP^3 \, qGeV^{12} +$
$4.04004 \times 10^{-6} \, c2p \, c3n \, MWIMP^3 \, qGeV^{12} - 5.80341 \times 10^{-9} \, c3n^2 \, MWIMP^3 \, qGeV^{12} +$
$3.93276 \times 10^{-6} \, c2n \, c3p \, MWIMP^3 \, qGeV^{12} + 1.62722 \times 10^{-6} \, c2p \, c3p \, MWIMP^3 \, qGeV^{12} +$
$9.86173 \times 10^{-11} \, c3n \, c3p \, MWIMP^3 \, qGeV^{12} + 4.41111 \times 10^{-13} \, c3p^2 \, MWIMP^3 \, qGeV^{12} -$
$0.000023819 \, c4n^2 \, MWIMP^3 \, qGeV^{12} - 1.56366 \times 10^{-11} \, c2n^2 \, MWIMP^4 \, qGeV^{12} +$
$8.25771 \times 10^{-14} \, c2n \, c2p \, MWIMP^4 \, qGeV^{12} + 8.63267 \times 10^{-13} \, c2p^2 \, MWIMP^4 \, qGeV^{12} +$
$3.76292 \times 10^{-8} \, c2n \, c3n \, MWIMP^4 \, qGeV^{12} + 1.64345 \times 10^{-8} \, c2p \, c3n \, MWIMP^4 \, qGeV^{12} +$
$0.0000580192 \, c3n^2 \, MWIMP^4 \, qGeV^{12} + 1.59981 \times 10^{-8} \, c2n \, c3p \, MWIMP^4 \, qGeV^{12} +$
$6.61935 \times 10^{-9} \, c2p \, c3p \, MWIMP^4 \, qGeV^{12} + 0.0000458336 \, c3n \, c3p \, MWIMP^4 \, qGeV^{12} +$
$8.53542 \times 10^{-6} \, c3p^2 \, MWIMP^4 \, qGeV^{12} + 8.57231 \times 10^{-8} \, c4n^2 \, MWIMP^4 \, qGeV^{12} +$
$2.0804 \times 10^{-7} \, c4n \, c4p \, MWIMP^4 \, qGeV^{12} + 7.47405 \times 10^{-8} \, c4p^2 \, MWIMP^4 \, qGeV^{12} -$
$0.0129053 \, c2n^2 \, qGeV^{14} - 0.0101603 \, c2n \, c2p \, qGeV^{14} - 0.00187661 \, c2p^2 \, qGeV^{14} -$
$0.000419979 \, c2n^2 \, MWIMP \, qGeV^{14} - 0.000330647 \, c2n \, c2p \, MWIMP \, qGeV^{14} -$
$0.0000610708 \, c2p^2 \, MWIMP \, qGeV^{14} - 2.84416 \times 10^{-6} \, c2n^2 \, MWIMP^2 \, qGeV^{14} -$
$3.59332 \times 10^{-6} \, c2n \, c2p \, MWIMP^2 \, qGeV^{14} - 7.24649 \times 10^{-7} \, c2p^2 \, MWIMP^2 \, qGeV^{14} -$
$0.00463139 \, c2n \, c3n \, MWIMP^2 \, qGeV^{14} - 0.00168275 \, c2p \, c3n \, MWIMP^2 \, qGeV^{14} +$
$6.41019 \times 10^{-6} \, c3n^2 \, MWIMP^2 \, qGeV^{14} - 0.00161882 \, c2n \, c3p \, MWIMP^2 \, qGeV^{14} -$
$0.000539067 \, c2p \, c3p \, MWIMP^2 \, qGeV^{14} - 2.30706 \times 10^{-7} \, c3n \, c3p \, MWIMP^2 \, qGeV^{14} +$
$1.56671 \times 10^{-9} \, c3p^2 \, MWIMP^2 \, qGeV^{14} + 0.0146592 \, c4n^2 \, MWIMP^2 \, qGeV^{14} +$
$9.31877 \times 10^{-9} \, c2n^2 \, MWIMP^3 \, qGeV^{14} - 1.46972 \times 10^{-8} \, c2n \, c2p \, MWIMP^3 \, qGeV^{14} -$
$3.70649 \times 10^{-9} \, c2p^2 \, MWIMP^3 \, qGeV^{14} - 0.0000753601 \, c2n \, c3n \, MWIMP^3 \, qGeV^{14} -$
$0.0000273811 \, c2p \, c3n \, MWIMP^3 \, qGeV^{14} + 1.04304 \times 10^{-7} \, c3n^2 \, MWIMP^3 \, qGeV^{14} -$
$0.0000263408 \, c2n \, c3p \, MWIMP^3 \, qGeV^{14} - 8.77148 \times 10^{-6} \, c2p \, c3p \, MWIMP^3 \, qGeV^{14} -$
$3.75396 \times 10^{-9} \, c3n \, c3p \, MWIMP^3 \, qGeV^{14} + 2.54929 \times 10^{-11} \, c3p^2 \, MWIMP^3 \, qGeV^{14} +$
$0.000238528 \, c4n^2 \, MWIMP^3 \, qGeV^{14} + 9.44493 \times 10^{-11} \, c2n^2 \, MWIMP^4 \, qGeV^{14} -$
$1.52717 \times 10^{-11} \, c2n \, c2p \, MWIMP^4 \, qGeV^{14} - 6.85567 \times 10^{-12} \, c2p^2 \, MWIMP^4 \, qGeV^{14} -$
$3.06557 \times 10^{-7} \, c2n \, c3n \, MWIMP^4 \, qGeV^{14} - 1.11383 \times 10^{-7} \, c2p \, c3n \, MWIMP^4 \, qGeV^{14} -$
$0.000375774 \, c3n^2 \, MWIMP^4 \, qGeV^{14} - 1.07152 \times 10^{-7} \, c2n \, c3p \, MWIMP^4 \, qGeV^{14} -$
$3.56815 \times 10^{-8} \, c2p \, c3p \, MWIMP^4 \, qGeV^{14} - 0.000236478 \, c3n \, c3p \, MWIMP^4 \, qGeV^{14} -$
$0.0000329658 \, c3p^2 \, MWIMP^4 \, qGeV^{14} - 3.25268 \times 10^{-7} \, c4n^2 \, MWIMP^4 \, qGeV^{14} -$
$1.48 \times 10^{-6} \, c4n \, c4p \, MWIMP^4 \, qGeV^{14} - 4.73717 \times 10^{-7} \, c4p^2 \, MWIMP^4 \, qGeV^{14} +$
$0.0765819 \, c2n^2 \, qGeV^{16} + 0.0492958 \, c2n \, c2p \, qGeV^{16} + 0.007205 \, c2p^2 \, qGeV^{16} +$
$0.00249222 \, c2n^2 \, MWIMP \, qGeV^{16} + 0.00160424 \, c2n \, c2p \, MWIMP \, qGeV^{16} +$
$0.000234474 \, c2p^2 \, MWIMP \, qGeV^{16} + 0.0000235158 \, c2n^2 \, MWIMP^2 \, qGeV^{16} +$
$0.0000185353 \, c2n \, c2p \, MWIMP^2 \, qGeV^{16} + 2.8233 \times 10^{-6} \, c2p^2 \, MWIMP^2 \, qGeV^{16} +$
$0.0216584 \, c2n \, c3n \, MWIMP^2 \, qGeV^{16} + 0.00624241 \, c2p \, c3n \, MWIMP^2 \, qGeV^{16} -$
$0.0000637751 \, c3n^2 \, MWIMP^2 \, qGeV^{16} + 0.00577308 \, c2n \, c3p \, MWIMP^2 \, qGeV^{16} +$
$0.00142317 \, c2p \, c3p \, MWIMP^2 \, qGeV^{16} + 3.08604 \times 10^{-6} \, c3n \, c3p \, MWIMP^2 \, qGeV^{16} -$
$3.56789 \times 10^{-8} \, c3p^2 \, MWIMP^2 \, qGeV^{16} - 0.0869899 \, c4n^2 \, MWIMP^2 \, qGeV^{16} +$
$5.27145 \times 10^{-8} \, c2n^2 \, MWIMP^3 \, qGeV^{16} + 8.92257 \times 10^{-8} \, c2n \, c2p \, MWIMP^3 \, qGeV^{16} +$
$1.48995 \times 10^{-8} \, c2p^2 \, MWIMP^3 \, qGeV^{16} + 0.000352416 \, c2n \, c3n \, MWIMP^3 \, qGeV^{16} +$
$0.000101574 \, c2p \, c3n \, MWIMP^3 \, qGeV^{16} - 1.03772 \times 10^{-6} \, c3n^2 \, MWIMP^3 \, qGeV^{16} +$
$0.0000939372 \, c2n \, c3p \, MWIMP^3 \, qGeV^{16} + 0.0000231573 \, c2p \, c3p \, MWIMP^3 \, qGeV^{16} +$
$5.02147 \times 10^{-8} \, c3n \, c3p \, MWIMP^3 \, qGeV^{16} - 5.80552 \times 10^{-10} \, c3p^2 \, MWIMP^3 \, qGeV^{16} -$
$0.00141546 \, c4n^2 \, MWIMP^3 \, qGeV^{16} - 1.21089 \times 10^{-10} \, c2n^2 \, MWIMP^4 \, qGeV^{16} +$
$1.46983 \times 10^{-10} \, c2n \, c2p \, MWIMP^4 \, qGeV^{16} + 2.90425 \times 10^{-11} \, c2p^2 \, MWIMP^4 \, qGeV^{16} +$
$1.43359 \times 10^{-6} \, c2n \, c3n \, MWIMP^4 \, qGeV^{16} + 4.13192 \times 10^{-7} \, c2p \, c3n \, MWIMP^4 \, qGeV^{16} +$
$0.00134928 \, c3n^2 \, MWIMP^4 \, qGeV^{16} + 3.82127 \times 10^{-7} \, c2n \, c3p \, MWIMP^4 \, qGeV^{16} +$
$9.42014 \times 10^{-8} \, c2p \, c3p \, MWIMP^4 \, qGeV^{16} + 0.000606652 \, c3n \, c3p \, MWIMP^4 \, qGeV^{16} +$
$0.0000497811 \, c3p^2 \, MWIMP^4 \, qGeV^{16} - 1.83998 \times 10^{-6} \, c4n^2 \, MWIMP^4 \, qGeV^{16} +$
$3.81544 \times 10^{-6} \, c4n \, c4p \, MWIMP^4 \, qGeV^{16} + 9.88272 \times 10^{-7} \, c4p^2 \, MWIMP^4 \, qGeV^{16} -$
$0.257631 \, c2n^2 \, qGeV^{18} - 0.127298 \, c2n \, c2p \, qGeV^{18} - 0.0135737 \, c2p^2 \, qGeV^{18} -$

$0.00838413\,\text{c2n}^2\,\text{MWIMP}\,\text{qGeV}^{18} - 0.00414267\,\text{c2n}\,\text{c2p}\,\text{MWIMP}\,\text{qGeV}^{18} -$
$0.000441732\,\text{c2p}^2\,\text{MWIMP}\,\text{qGeV}^{18} - 0.0000987515\,\text{c2n}^2\,\text{MWIMP}^2\,\text{qGeV}^{18} -$
$0.0000502769\,\text{c2n}\,\text{c2p}\,\text{MWIMP}^2\,\text{qGeV}^{18} - 5.39076\times10^{-6}\,\text{c2p}^2\,\text{MWIMP}^2\,\text{qGeV}^{18} -$
$0.0546043\,\text{c2n}\,\text{c3n}\,\text{MWIMP}^2\,\text{qGeV}^{18} - 0.01157\,\text{c2p}\,\text{c3n}\,\text{MWIMP}^2\,\text{qGeV}^{18} +$
$0.000322229\,\text{c3n}^2\,\text{MWIMP}^2\,\text{qGeV}^{18} - 0.00927264\,\text{c2n}\,\text{c3p}\,\text{MWIMP}^2\,\text{qGeV}^{18} -$
$0.00138224\,\text{c2p}\,\text{c3p}\,\text{MWIMP}^2\,\text{qGeV}^{18} - 0.000017625\,\text{c3n}\,\text{c3p}\,\text{MWIMP}^2\,\text{qGeV}^{18} +$
$2.39317\times10^{-7}\,\text{c3p}^2\,\text{MWIMP}^2\,\text{qGeV}^{18} + 0.292645\,\text{c4n}^2\,\text{MWIMP}^2\,\text{qGeV}^{18} -$
$4.96933\times10^{-7}\,\text{c2n}^2\,\text{MWIMP}^3\,\text{qGeV}^{18} - 2.69669\times10^{-7}\,\text{c2n}\,\text{c2p}\,\text{MWIMP}^3\,\text{qGeV}^{18} -$
$2.92387\times10^{-8}\,\text{c2p}^2\,\text{MWIMP}^3\,\text{qGeV}^{18} - 0.000888499\,\text{c2n}\,\text{c3n}\,\text{MWIMP}^3\,\text{qGeV}^{18} -$
$0.000188262\,\text{c2p}\,\text{c3n}\,\text{MWIMP}^3\,\text{qGeV}^{18} + 5.24317\times10^{-6}\,\text{c3n}^2\,\text{MWIMP}^3\,\text{qGeV}^{18} -$
$0.000150881\,\text{c2n}\,\text{c3p}\,\text{MWIMP}^3\,\text{qGeV}^{18} - 0.0000224913\,\text{c2p}\,\text{c3p}\,\text{MWIMP}^3\,\text{qGeV}^{18} -$
$2.86787\times10^{-7}\,\text{c3n}\,\text{c3p}\,\text{MWIMP}^3\,\text{qGeV}^{18} + 3.89407\times10^{-9}\,\text{c3p}^2\,\text{MWIMP}^3\,\text{qGeV}^{18} +$
$0.00476179\,\text{c4n}^2\,\text{MWIMP}^3\,\text{qGeV}^{18} - 8.92724\times10^{-10}\,\text{c2n}^2\,\text{MWIMP}^4\,\text{qGeV}^{18} -$
$5.3926\times10^{-10}\,\text{c2n}\,\text{c2p}\,\text{MWIMP}^4\,\text{qGeV}^{18} - 5.947\times10^{-11}\,\text{c2p}^2\,\text{MWIMP}^4\,\text{qGeV}^{18} -$
$3.61432\times10^{-6}\,\text{c2n}\,\text{c3n}\,\text{MWIMP}^4\,\text{qGeV}^{18} - 7.65829\times10^{-7}\,\text{c2p}\,\text{c3n}\,\text{MWIMP}^4\,\text{qGeV}^{18} -$
$0.00246167\,\text{c3n}^2\,\text{MWIMP}^4\,\text{qGeV}^{18} - 6.13767\times10^{-7}\,\text{c2n}\,\text{c3p}\,\text{MWIMP}^4\,\text{qGeV}^{18} -$
$9.14922\times10^{-8}\,\text{c2p}\,\text{c3p}\,\text{MWIMP}^4\,\text{qGeV}^{18} - 0.000589969\,\text{c3n}\,\text{c3p}\,\text{MWIMP}^4\,\text{qGeV}^{18} -$
$7.0613\times10^{-11}\,\text{c3p}^2\,\text{MWIMP}^4\,\text{qGeV}^{18} + 0.0000173453\,\text{c4n}^2\,\text{MWIMP}^4\,\text{qGeV}^{18} -$
$1.01632\times10^{-6}\,\text{c4n}\,\text{c4p}\,\text{MWIMP}^4\,\text{qGeV}^{18} - 1.05193\times10^{-11}\,\text{c4p}^2\,\text{MWIMP}^4\,\text{qGeV}^{18} +$
$0.438116\,\text{c2n}^2\,\text{qGeV}^{20} + 0.148079\,\text{c2n}\,\text{c2p}\,\text{qGeV}^{20} + 0.0097828\,\text{c2p}^2\,\text{qGeV}^{20} +$
$0.0142577\,\text{c2n}^2\,\text{MWIMP}\,\text{qGeV}^{20} + 0.00481895\,\text{c2n}\,\text{c2p}\,\text{MWIMP}\,\text{qGeV}^{20} +$
$0.000318363\,\text{c2p}^2\,\text{MWIMP}\,\text{qGeV}^{20} + 0.000173485\,\text{c2n}^2\,\text{MWIMP}^2\,\text{qGeV}^{20} +$
$0.000058809\,\text{c2n}\,\text{c2p}\,\text{MWIMP}^2\,\text{qGeV}^{20} + 3.88521\times10^{-6}\,\text{c2p}^2\,\text{MWIMP}^2\,\text{qGeV}^{20} +$
$0.0631101\,\text{c2n}\,\text{c3n}\,\text{MWIMP}^2\,\text{qGeV}^{20} + 0.00832213\,\text{c2p}\,\text{c3n}\,\text{MWIMP}^2\,\text{qGeV}^{20} -$
$0.000629838\,\text{c3n}^2\,\text{MWIMP}^2\,\text{qGeV}^{20} + 0.00350357\,\text{c2n}\,\text{c3p}\,\text{MWIMP}^2\,\text{qGeV}^{20} +$
$1.71145\times10^{-9}\,\text{c2p}\,\text{c3p}\,\text{MWIMP}^2\,\text{qGeV}^{20} + 0.0000357047\,\text{c3n}\,\text{c3p}\,\text{MWIMP}^2\,\text{qGeV}^{20} -$
$5.13714\times10^{-7}\,\text{c3p}^2\,\text{MWIMP}^2\,\text{qGeV}^{20} - 0.497659\,\text{c4n}^2\,\text{MWIMP}^2\,\text{qGeV}^{20} +$
$9.35405\times10^{-7}\,\text{c2n}^2\,\text{MWIMP}^3\,\text{qGeV}^{20} + 3.18972\times10^{-7}\,\text{c2n}\,\text{c2p}\,\text{MWIMP}^3\,\text{qGeV}^{20} +$
$2.10728\times10^{-8}\,\text{c2p}^2\,\text{MWIMP}^3\,\text{qGeV}^{20} + 0.0010269\,\text{c2n}\,\text{c3n}\,\text{MWIMP}^3\,\text{qGeV}^{20} +$
$0.000135414\,\text{c2p}\,\text{c3n}\,\text{MWIMP}^3\,\text{qGeV}^{20} - 0.0000102485\,\text{c3n}^2\,\text{MWIMP}^3\,\text{qGeV}^{20} +$
$0.0000570087\,\text{c2n}\,\text{c3p}\,\text{MWIMP}^3\,\text{qGeV}^{20} + 2.7848\times10^{-11}\,\text{c2p}\,\text{c3p}\,\text{MWIMP}^3\,\text{qGeV}^{20} +$
$5.80973\times10^{-7}\,\text{c3n}\,\text{c3p}\,\text{MWIMP}^3\,\text{qGeV}^{20} - 8.35894\times10^{-9}\,\text{c3p}^2\,\text{MWIMP}^3\,\text{qGeV}^{20} -$
$0.0080977\,\text{c4n}^2\,\text{MWIMP}^3\,\text{qGeV}^{20} + 1.88563\times10^{-9}\,\text{c2n}^2\,\text{MWIMP}^4\,\text{qGeV}^{20} +$
$6.48773\times10^{-10}\,\text{c2n}\,\text{c2p}\,\text{MWIMP}^4\,\text{qGeV}^{20} + 4.28611\times10^{-11}\,\text{c2p}^2\,\text{MWIMP}^4\,\text{qGeV}^{20} +$
$4.17733\times10^{-6}\,\text{c2n}\,\text{c3n}\,\text{MWIMP}^4\,\text{qGeV}^{20} + 5.50851\times10^{-7}\,\text{c2p}\,\text{c3n}\,\text{MWIMP}^4\,\text{qGeV}^{20} +$
$0.00177114\,\text{c3n}^2\,\text{MWIMP}^4\,\text{qGeV}^{20} + 2.31905\times10^{-7}\,\text{c2n}\,\text{c3p}\,\text{MWIMP}^4\,\text{qGeV}^{20} +$
$1.13283\times10^{-13}\,\text{c2p}\,\text{c3p}\,\text{MWIMP}^4\,\text{qGeV}^{20} + 2.87593\times10^{-9}\,\text{c3n}\,\text{c3p}\,\text{MWIMP}^4\,\text{qGeV}^{20} -$
$3.40033\times10^{-11}\,\text{c3p}^2\,\text{MWIMP}^4\,\text{qGeV}^{20} - 0.0000326499\,\text{c4n}^2\,\text{MWIMP}^4\,\text{qGeV}^{20} +$
$5.9109\times10^{-12}\,\text{c4n}\,\text{c4p}\,\text{MWIMP}^4\,\text{qGeV}^{20} + 3.09099\times10^{-17}\,\text{c4p}^2\,\text{MWIMP}^4\,\text{qGeV}^{20} -$
$0.287883\,\text{c2n}^2\,\text{qGeV}^{22} - 0.0494412\,\text{c2n}\,\text{c2p}\,\text{qGeV}^{22} - 7.13635\times10^{-9}\,\text{c2p}^2\,\text{qGeV}^{22} -$
$0.00936863\,\text{c2n}^2\,\text{MWIMP}\,\text{qGeV}^{22} - 0.00160897\,\text{c2n}\,\text{c2p}\,\text{MWIMP}\,\text{qGeV}^{22} -$
$2.32239\times10^{-10}\,\text{c2p}^2\,\text{MWIMP}\,\text{qGeV}^{22} - 0.000114332\,\text{c2n}^2\,\text{MWIMP}^2\,\text{qGeV}^{22} -$
$0.0000196354\,\text{c2n}\,\text{c2p}\,\text{MWIMP}^2\,\text{qGeV}^{22} - 2.83418\times10^{-12}\,\text{c2p}^2\,\text{MWIMP}^2\,\text{qGeV}^{22} -$
$0.0210395\,\text{c2n}\,\text{c3n}\,\text{MWIMP}^2\,\text{qGeV}^{22} - 3.03905\times10^{-9}\,\text{c2p}\,\text{c3n}\,\text{MWIMP}^2\,\text{qGeV}^{22} -$
$0.000112478\,\text{c3n}^2\,\text{MWIMP}^2\,\text{qGeV}^{22} - 3.03905\times10^{-9}\,\text{c2n}\,\text{c3p}\,\text{MWIMP}^2\,\text{qGeV}^{22} -$
$4.34976\times10^{-16}\,\text{c2p}\,\text{c3p}\,\text{MWIMP}^2\,\text{qGeV}^{22} + 3.21585\times10^{-6}\,\text{c3n}\,\text{c3p}\,\text{MWIMP}^2\,\text{qGeV}^{22} +$
$5.79536\times10^{-12}\,\text{c3p}^2\,\text{MWIMP}^2\,\text{qGeV}^{22} + 0.327008\,\text{c4n}^2\,\text{MWIMP}^2\,\text{qGeV}^{22} -$
$6.2012\times10^{-7}\,\text{c2n}^2\,\text{MWIMP}^3\,\text{qGeV}^{22} - 1.065\times10^{-7}\,\text{c2n}\,\text{c2p}\,\text{MWIMP}^3\,\text{qGeV}^{22} -$
$1.53722\times10^{-14}\,\text{c2p}^2\,\text{MWIMP}^3\,\text{qGeV}^{22} - 0.000342346\,\text{c2n}\,\text{c3n}\,\text{MWIMP}^3\,\text{qGeV}^{22} -$
$4.94502\times10^{-11}\,\text{c2p}\,\text{c3n}\,\text{MWIMP}^3\,\text{qGeV}^{22} - 1.8302\times10^{-6}\,\text{c3n}^2\,\text{MWIMP}^3\,\text{qGeV}^{22} -$
$4.94502\times10^{-11}\,\text{c2n}\,\text{c3p}\,\text{MWIMP}^3\,\text{qGeV}^{22} - 7.07775\times10^{-18}\,\text{c2p}\,\text{c3p}\,\text{MWIMP}^3\,\text{qGeV}^{22} +$
$5.23269\times10^{-8}\,\text{c3n}\,\text{c3p}\,\text{MWIMP}^3\,\text{qGeV}^{22} + 9.42998\times10^{-14}\,\text{c3p}^2\,\text{MWIMP}^3\,\text{qGeV}^{22} +$
$0.00532094\,\text{c4n}^2\,\text{MWIMP}^3\,\text{qGeV}^{22} - 1.26129\times10^{-9}\,\text{c2n}^2\,\text{MWIMP}^4\,\text{qGeV}^{22} -$
$2.16615\times10^{-10}\,\text{c2n}\,\text{c2p}\,\text{MWIMP}^4\,\text{qGeV}^{22} - 3.12662\times10^{-17}\,\text{c2p}^2\,\text{MWIMP}^4\,\text{qGeV}^{22} -$

$1.39263 \times 10^{-6} \, c2n \, c3n \, MWIMP^4 \, qGeV^{22} - 2.01158 \times 10^{-13} \, c2p \, c3n \, MWIMP^4 \, qGeV^{22} -$
$7.44508 \times 10^{-9} \, c3n^2 \, MWIMP^4 \, qGeV^{22} - 2.01158 \times 10^{-13} \, c2n \, c3p \, MWIMP^4 \, qGeV^{22} -$
$2.87916 \times 10^{-20} \, c2p \, c3p \, MWIMP^4 \, qGeV^{22} + 2.12861 \times 10^{-10} \, c3n \, c3p \, MWIMP^4 \, qGeV^{22} +$
$3.83602 \times 10^{-16} \, c3p^2 \, MWIMP^4 \, qGeV^{22} + 0.000021645 \, c4n^2 \, MWIMP^4 \, qGeV^{22} +$
$0.0625 \, c2n^2 \, qGeV^{24} + 1.8088 \times 10^{-8} \, c2n \, c2p \, qGeV^{24} + 1.32455 \times 10^{-15} \, c2p^2 \, qGeV^{24} +$
$0.00203395 \, c2n^2 \, MWIMP \, qGeV^{24} + 5.8864 \times 10^{-10} \, c2n \, c2p \, MWIMP \, qGeV^{24} +$
$4.31052 \times 10^{-17} \, c2p^2 \, MWIMP \, qGeV^{24} + 0.0000248217 \, c2n^2 \, MWIMP^2 \, qGeV^{24} +$
$7.18359 \times 10^{-12} \, c2n \, c2p \, MWIMP^2 \, qGeV^{24} + 5.26043 \times 10^{-19} \, c2p^2 \, MWIMP^2 \, qGeV^{24} -$
$5.08949 \times 10^{-6} \, c3n^2 \, MWIMP^2 \, qGeV^{24} - 1.85817 \times 10^{-11} \, c3n \, c3p \, MWIMP^2 \, qGeV^{24} -$
$1.72123 \times 10^{-17} \, c3p^2 \, MWIMP^2 \, qGeV^{24} - 0.0709941 \, c4n^2 \, MWIMP^2 \, qGeV^{24} +$
$1.34629 \times 10^{-7} \, c2n^2 \, MWIMP^3 \, qGeV^{24} + 3.89628 \times 10^{-14} \, c2n \, c2p \, MWIMP^3 \, qGeV^{24} +$
$2.85318 \times 10^{-21} \, c2p^2 \, MWIMP^3 \, qGeV^{24} - 8.28141 \times 10^{-8} \, c3n^2 \, MWIMP^3 \, qGeV^{24} -$
$3.02354 \times 10^{-13} \, c3n \, c3p \, MWIMP^3 \, qGeV^{24} - 2.80072 \times 10^{-19} \, c3p^2 \, MWIMP^3 \, qGeV^{24} -$
$0.00115519 \, c4n^2 \, MWIMP^3 \, qGeV^{24} + 2.73829 \times 10^{-10} \, c2n^2 \, MWIMP^4 \, qGeV^{24} +$
$7.92483 \times 10^{-17} \, c2n \, c2p \, MWIMP^4 \, qGeV^{24} + 5.80323 \times 10^{-24} \, c2p^2 \, MWIMP^4 \, qGeV^{24} -$
$3.36879 \times 10^{-10} \, c3n^2 \, MWIMP^4 \, qGeV^{24} - 1.22994 \times 10^{-15} \, c3n \, c3p \, MWIMP^4 \, qGeV^{24} -$
$1.1393 \times 10^{-21} \, c3p^2 \, MWIMP^4 \, qGeV^{24} - 4.69918 \times 10^{-6} \, c4n^2 \, MWIMP^4 \, qGeV^{24} + c1p^2 \, MWIMP^4$
$\quad \left(2.48186 \times 10^{-9} - 3.01852 \times 10^{-7} \, qGeV^2 + 0.0000141851 \, qGeV^4 - 0.000331861 \right.$
$\qquad qGeV^6 + 0.00423033 \, qGeV^8 - 0.0300258 \, qGeV^{10} + 0.11528 \, qGeV^{12} - 0.217179$
$\qquad \left. qGeV^{14} + 0.156525 \, qGeV^{16} - 1.14182 \times 10^{-7} \, qGeV^{18} + 2.11929 \times 10^{-14} \, qGeV^{20} \right) +$
$c1n^2 \, MWIMP^4 \left(5.04563 \times 10^{-9} - 7.2512 \times 10^{-7} \, qGeV^2 + 0.0000413839 \, qGeV^4 - \right.$
$\qquad 0.00122195 \, qGeV^6 + 0.0206191 \, qGeV^8 - 0.206485 \, qGeV^{10} + 1.22531 \, qGeV^{12} -$
$\qquad \left. 4.1221 \, qGeV^{14} + 7.00986 \, qGeV^{16} - 4.60613 \, qGeV^{18} + 1. \, qGeV^{20} \right) +$
$c1p \, MWIMP^2 \, qGeV^2 \left(MWIMP^2 \left(c3p \left(-5.34425 \times 10^{-10} + 5.41295 \times 10^{-8} \, qGeV^2 - 2.08582 \times \right. \right. \right.$
$\qquad\qquad 10^{-6} \, qGeV^4 + 0.0000395595 \, qGeV^6 - 0.000400022 \, qGeV^8 +$
$\qquad\qquad 0.00215637 \, qGeV^{10} - 0.00569324 \, qGeV^{12} + 0.00553007$
$\qquad\qquad \left. qGeV^{14} - 6.85962 \times 10^{-9} \, qGeV^{16} + 1.78382 \times 10^{-15} \, qGeV^{18} \right) +$
$\qquad\quad c3n \left(-7.40852 \times 10^{-10} + 8.44804 \times 10^{-8} \, qGeV^2 - 3.72741 \times 10^{-6} \right.$
$\qquad\qquad qGeV^4 + 0.0000821958 \, qGeV^6 - 0.000992714 \, qGeV^8 +$
$\qquad\qquad 0.00672688 \, qGeV^{10} - 0.0249499 \, qGeV^{12} + 0.0462428$
$\qquad\qquad \left. \left. qGeV^{14} - 0.033292 \, qGeV^{16} + 1.21799 \times 10^{-8} \, qGeV^{18} \right) \right) +$
$\qquad c2n \left(-1.76936 \times 10^{-9} + 2.34737 \times 10^{-7} \, qGeV^2 - 0.0000122046 \, qGeV^4 + \right.$
$\qquad\qquad 0.000322569 \, qGeV^6 - 0.00476742 \, qGeV^8 + 0.0406411 \, qGeV^{10} -$
$\qquad\qquad 0.197183 \, qGeV^{12} + 0.509191 \, qGeV^{14} - 0.592315 \, qGeV^{16} +$
$\qquad\qquad 0.197765 \, qGeV^{18} - 7.23519 \times 10^{-8} \, qGeV^{20} + MWIMP \left(-2.87903 \times 10^{-11} + \right.$
$\qquad\qquad 3.81955 \times 10^{-9} \, qGeV^2 - 1.98588 \times 10^{-7} \, qGeV^4 + 5.24872 \times 10^{-6}$
$\qquad\qquad qGeV^6 - 0.0000775734 \, qGeV^8 + 0.000661295 \, qGeV^{10} -$
$\qquad\qquad 0.00320848 \, qGeV^{12} + 0.00828534 \, qGeV^{14} - 0.00963791$
$\qquad\qquad \left. qGeV^{16} + 0.00321795 \, qGeV^{18} - 1.17728 \times 10^{-9} \, qGeV^{20} \right) +$
$\qquad\qquad MWIMP^2 \left(-1.17116 \times 10^{-13} + 1.55375 \times 10^{-11} \, qGeV^2 - \right.$
$\qquad\qquad 8.07834 \times 10^{-10} \, qGeV^4 + 2.13512 \times 10^{-8} \, qGeV^6 - 3.15561 \times 10^{-7}$
$\qquad\qquad qGeV^8 + 2.69008 \times 10^{-6} \, qGeV^{10} - 0.0000130518$
$\qquad\qquad qGeV^{12} + 0.0000337039 \, qGeV^{14} - 0.000039206$
$\qquad\qquad \left. \left. qGeV^{16} + 0.0000130903 \, qGeV^{18} - 4.78906 \times 10^{-12} \, qGeV^{20} \right) \right) +$
$\qquad c2p \left(-1.24093 \times 10^{-9} + 1.50926 \times 10^{-7} \, qGeV^2 - 7.09254 \times 10^{-6} \, qGeV^4 + \right.$
$\qquad\qquad 0.00016593 \, qGeV^6 - 0.00211516 \, qGeV^8 + 0.0150129 \, qGeV^{10} -$
$\qquad\qquad 0.05764 \, qGeV^{12} + 0.10859 \, qGeV^{14} - 0.0782624 \, qGeV^{16} +$
$\qquad\qquad 5.70908 \times 10^{-8} \, qGeV^{18} - 1.05964 \times 10^{-14} \, qGeV^{20} +$
$\qquad\qquad MWIMP \left(-2.01919 \times 10^{-11} + 2.45581 \times 10^{-9} \, qGeV^2 - 1.15407 \times 10^{-7} \right.$
$\qquad\qquad qGeV^4 + 2.69995 \times 10^{-6} \, qGeV^6 - 0.0000344171 \, qGeV^8 +$
$\qquad\qquad 0.000244283 \, qGeV^{10} - 0.000937895 \, qGeV^{12} + 0.00176693$
$\qquad\qquad qGeV^{14} - 0.00127345 \, qGeV^{16} + 9.28958 \times 10^{-10} \, qGeV^{18} -$

$$1.72421\times10^{-16}\,\text{qGeV}^{20}\big) + \text{MWIMP}^2\,\big(-8.21385\times10^{-14} +$$
$$9.98998\times10^{-12}\,\text{qGeV}^2 - 4.69463\times10^{-10}\,\text{qGeV}^4 + 1.09831\times10^{-8}$$
$$\text{qGeV}^6 - 1.40005\times10^{-7}\,\text{qGeV}^8 + 9.9372\times10^{-7}\,\text{qGeV}^{10} -$$
$$3.81526\times10^{-6}\,\text{qGeV}^{12} + 7.18768\times10^{-6}\,\text{qGeV}^{14} - 5.18028\times10^{-6}$$
$$\text{qGeV}^{16} + 3.7789\times10^{-12}\,\text{qGeV}^{18} - 7.0139\times10^{-19}\,\text{qGeV}^{20}\big)\big)\big) +$$
$$\text{c1n}\,\text{MWIMP}^2\,\big(\text{c1p}\,\text{MWIMP}^2\,\big(7.07744\times10^{-9} - 9.3895\times10^{-7}\,\text{qGeV}^2 +$$
$$0.0000488182\,\text{qGeV}^4 - 0.00129028\,\text{qGeV}^6 + 0.0190697\,\text{qGeV}^8 -$$
$$0.162564\,\text{qGeV}^{10} + 0.788732\,\text{qGeV}^{12} - 2.03676\,\text{qGeV}^{14} +$$
$$2.36926\,\text{qGeV}^{16} - 0.791059\,\text{qGeV}^{18} + 2.89408\times10^{-7}\,\text{qGeV}^{20}\big) +$$
$$\text{qGeV}^2\,\big(\text{MWIMP}^2\,\big(\text{c3p}\,\big(-7.62002\times10^{-10} + 8.55955\times10^{-8}\,\text{qGeV}^2 -$$
$$3.70375\times10^{-6}\,\text{qGeV}^4 + 0.0000806904\,\text{qGeV}^6 -$$
$$0.000966827\,\text{qGeV}^8 + 0.00647613\,\text{qGeV}^{10} -$$
$$0.0230982\,\text{qGeV}^{12} + 0.0371058\,\text{qGeV}^{14} -$$
$$0.0140184\,\text{qGeV}^{16} + 1.21799\times10^{-8}\,\text{qGeV}^{18}\big) + \text{c3n}$$
$$\big(-1.05633\times10^{-9} + 1.32122\times10^{-7}\,\text{qGeV}^2 - 6.47461\times10^{-6}$$
$$\text{qGeV}^4 + 0.000161817\,\text{qGeV}^6 - 0.00227081\,\text{qGeV}^8 +$$
$$0.0184889\,\text{qGeV}^{10} - 0.086415\,\text{qGeV}^{12} + 0.217885$$
$$\text{qGeV}^{14} - 0.252344\,\text{qGeV}^{16} + 0.0841709\,\text{qGeV}^{18}\big)\big) +$$
$$\text{c2n}\,\big(-2.52282\times10^{-9} + 3.6256\times10^{-7}\,\text{qGeV}^2 - 0.0000206919$$
$$\text{qGeV}^4 + 0.000610977\,\text{qGeV}^6 - 0.0103096\,\text{qGeV}^8 + 0.103242$$
$$\text{qGeV}^{10} - 0.612655\,\text{qGeV}^{12} + 2.06105\,\text{qGeV}^{14} - 3.50493$$
$$\text{qGeV}^{16} + 2.30306\,\text{qGeV}^{18} - 0.5\,\text{qGeV}^{20} + \text{MWIMP}$$
$$\big(-4.10502\times10^{-11} + 5.89943\times10^{-9}\,\text{qGeV}^2 - 3.36691\times10^{-7}$$
$$\text{qGeV}^4 + 9.94156\times10^{-6}\,\text{qGeV}^6 - 0.000167753\,\text{qGeV}^8 +$$
$$0.00167992\,\text{qGeV}^{10} - 0.00996887\,\text{qGeV}^{12} + 0.0335365$$
$$\text{qGeV}^{14} - 0.0570308\,\text{qGeV}^{16} + 0.0374745\,\text{qGeV}^{18} -$$
$$0.00813579\,\text{qGeV}^{20}\big) + \text{MWIMP}^2\,\big(-1.66988\times10^{-13} +$$
$$2.39983\times10^{-11}\,\text{qGeV}^2 - 1.36962\times10^{-9}\,\text{qGeV}^4 +$$
$$4.04412\times10^{-8}\,\text{qGeV}^6 - 6.82402\times10^{-7}\,\text{qGeV}^8 +$$
$$6.83373\times10^{-6}\,\text{qGeV}^{10} - 0.0000405524\,\text{qGeV}^{12} +$$
$$0.000136423\,\text{qGeV}^{14} - 0.000231995\,\text{qGeV}^{16} +$$
$$0.000152442\,\text{qGeV}^{18} - 0.0000330956\,\text{qGeV}^{20}\big)\big) +$$
$$\text{c2p}\,\big(-1.76936\times10^{-9} + 2.34737\times10^{-7}\,\text{qGeV}^2 - 0.0000122046$$
$$\text{qGeV}^4 + 0.000322569\,\text{qGeV}^6 - 0.00476742\,\text{qGeV}^8 +$$
$$0.0406411\,\text{qGeV}^{10} - 0.197183\,\text{qGeV}^{12} + 0.509191\,\text{qGeV}^{14} -$$
$$0.592315\,\text{qGeV}^{16} + 0.197765\,\text{qGeV}^{18} - 7.23519\times10^{-8}$$
$$\text{qGeV}^{20} + \text{MWIMP}\,\big(-2.87903\times10^{-11} + 3.81955\times10^{-9}\,\text{qGeV}^2 -$$
$$1.98588\times10^{-7}\,\text{qGeV}^4 + 5.24872\times10^{-6}\,\text{qGeV}^6 -$$
$$0.0000775734\,\text{qGeV}^8 + 0.000661295\,\text{qGeV}^{10} -$$
$$0.00320848\,\text{qGeV}^{12} + 0.00828534\,\text{qGeV}^{14} -$$
$$0.00963791\,\text{qGeV}^{16} + 0.00321795\,\text{qGeV}^{18} -$$
$$1.17728\times10^{-9}\,\text{qGeV}^{20}\big) + \text{MWIMP}^2\,\big(-1.17116\times10^{-13} +$$
$$1.55375\times10^{-11}\,\text{qGeV}^2 - 8.07834\times10^{-10}\,\text{qGeV}^4 +$$
$$2.13512\times10^{-8}\,\text{qGeV}^6 - 3.15561\times10^{-7}\,\text{qGeV}^8 +$$
$$2.69008\times10^{-6}\,\text{qGeV}^{10} - 0.0000130518\,\text{qGeV}^{12} +$$
$$0.0000337039\,\text{qGeV}^{14} - 0.000039206\,\text{qGeV}^{16} +$$
$$0.0000130903\,\text{qGeV}^{18} - 4.78906\times10^{-12}\,\text{qGeV}^{20}\big)\big)\big)\big)\big)$$
$$\Big(\text{Erf}\Big[1.05455 - 5.54336\,\text{qGeV} - \frac{681.355\,\text{qGeV}}{\text{MWIMP}}\Big] + \text{Erf}\Big[1.05455 + 5.54336\,\text{qGeV} +$$
$$\frac{681.355\,\text{qGeV}}{\text{MWIMP}}\Big]\Big) -$$

$$1.06031\, e^{-\frac{61.4577\left(15107.8+245.827\,\text{MWIMP}+1.\,\text{MWIMP}^2\right)\text{qGeV}^2}{\text{MWIMP}^2}}$$

MWIMP

$\big(\text{c1p}\,\text{MWIMP}^2\,\big(\text{c2p}\,\big(2.48186\times10^{-9}-3.01852\times10^{-7}\,\text{qGeV}^2+0.0000141851\,\text{qGeV}^4-$
$\qquad 0.000331861\,\text{qGeV}^6+0.00423033\,\text{qGeV}^8-0.0300258\,\text{qGeV}^{10}+$
$\qquad 0.11528\,\text{qGeV}^{12}-0.217179\,\text{qGeV}^{14}+0.156525\,\text{qGeV}^{16}-$
$\qquad 1.14182\times10^{-7}\,\text{qGeV}^{18}+2.11929\times10^{-14}\,\text{qGeV}^{20}\big)+$
$\quad \text{c2n}\,\big(3.53872\times10^{-9}-4.69475\times10^{-7}\,\text{qGeV}^2+0.0000244091\,\text{qGeV}^4-$
$\qquad 0.000645139\,\text{qGeV}^6+0.00953483\,\text{qGeV}^8-0.0812821\,\text{qGeV}^{10}+$
$\qquad 0.394366\,\text{qGeV}^{12}-1.01838\,\text{qGeV}^{14}+1.18463\,\text{qGeV}^{16}-$
$\qquad 0.395529\,\text{qGeV}^{18}+1.44704\times10^{-7}\,\text{qGeV}^{20}\big)\big)+$
$\text{c1n}\,\text{MWIMP}^2\,\big(\text{c2p}\,\big(3.53872\times10^{-9}-4.69475\times10^{-7}\,\text{qGeV}^2+0.0000244091\,\text{qGeV}^4-$
$\qquad 0.000645139\,\text{qGeV}^6+0.00953483\,\text{qGeV}^8-0.0812821\,\text{qGeV}^{10}+$
$\qquad 0.394366\,\text{qGeV}^{12}-1.01838\,\text{qGeV}^{14}+1.18463\,\text{qGeV}^{16}-$
$\qquad 0.395529\,\text{qGeV}^{18}+1.44704\times10^{-7}\,\text{qGeV}^{20}\big)+$
$\quad \text{c2n}\,\big(5.04563\times10^{-9}-7.2512\times10^{-7}\,\text{qGeV}^2+0.0000413839\,\text{qGeV}^4-0.00122195$
$\qquad \text{qGeV}^6+0.0206191\,\text{qGeV}^8-0.206485\,\text{qGeV}^{10}+1.22531\,\text{qGeV}^{12}-$
$\qquad 4.1221\,\text{qGeV}^{14}+7.00986\,\text{qGeV}^{16}-4.60613\,\text{qGeV}^{18}+1.\,\text{qGeV}^{20}\big)\big)+$
$\text{qGeV}^2\,\big(\text{c2p}\,\text{MWIMP}^2\,\big(\text{c3p}\,\big(-2.67213\times10^{-10}+2.70649\times10^{-8}\,\text{qGeV}^2-1.04291\times10^{-6}$
$\qquad \text{qGeV}^4+0.0000197797\,\text{qGeV}^6-0.000200007\,\text{qGeV}^8+$
$\qquad 0.00107813\,\text{qGeV}^{10}-0.00284635\,\text{qGeV}^{12}+0.00276449$
$\qquad \text{qGeV}^{14}-3.42289\times10^{-9}\,\text{qGeV}^{16}+8.69952\times10^{-16}\,\text{qGeV}^{18}\big)+$
$\quad \text{c3n}\,\big(-3.70457\times10^{-10}+4.22462\times10^{-8}\,\text{qGeV}^2-1.8641\times10^{-6}$
$\qquad \text{qGeV}^4+0.0000411106\,\text{qGeV}^6-0.000496576\,\text{qGeV}^8+$
$\qquad 0.00336551\,\text{qGeV}^{10}-0.0124848\,\text{qGeV}^{12}+0.0231399$
$\qquad \text{qGeV}^{14}-0.0166443\,\text{qGeV}^{16}+6.07811\times10^{-9}\,\text{qGeV}^{18}\big)\big)+$
$\text{c2n}^2\,\big(-1.26141\times10^{-9}+1.8128\times10^{-7}\,\text{qGeV}^2-0.000010346\,\text{qGeV}^4+$
$\qquad 0.000305488\,\text{qGeV}^6-0.00515478\,\text{qGeV}^8+0.0516212\,\text{qGeV}^{10}-$
$\qquad 0.306328\,\text{qGeV}^{12}+1.03052\,\text{qGeV}^{14}-1.75247\,\text{qGeV}^{16}+$
$\qquad 1.15153\,\text{qGeV}^{18}-0.25\,\text{qGeV}^{20}+\text{MWIMP}\,\big(-2.05251\times10^{-11}+2.94971\times$
$\qquad 10^{-9}\,\text{qGeV}^2-1.68345\times10^{-7}\,\text{qGeV}^4+4.97078\times10^{-6}\,\text{qGeV}^6-$
$\qquad 0.0000838765\,\text{qGeV}^8+0.000839958\,\text{qGeV}^{10}-0.00498444$
$\qquad \text{qGeV}^{12}+0.0167683\,\text{qGeV}^{14}-0.0285154\,\text{qGeV}^{16}+0.0187373$
$\qquad \text{qGeV}^{18}-0.0040679\,\text{qGeV}^{20}\big)+\text{MWIMP}^2\,\big(4.57521\times10^{-13}-$
$\qquad 3.49107\times10^{-11}\,\text{qGeV}^2+1.3005\times10^{-9}\,\text{qGeV}^4-2.67392\times10^{-8}$
$\qquad \text{qGeV}^6+3.01867\times10^{-7}\,\text{qGeV}^8-1.1454\times10^{-6}\,\text{qGeV}^{10}-$
$\qquad 6.47933\times10^{-6}\,\text{qGeV}^{12}+0.0000610799\,\text{qGeV}^{14}-0.000114974$
$\qquad \text{qGeV}^{16}+0.0000762212\,\text{qGeV}^{18}-0.0000165478\,\text{qGeV}^{20}\big)\big)+$
$\text{c2p}^2\,\big(-6.20465\times10^{-10}+7.54631\times10^{-8}\,\text{qGeV}^2-3.54627\times10^{-6}\,\text{qGeV}^4+$
$\qquad 0.0000829652\,\text{qGeV}^6-0.00105758\,\text{qGeV}^8+0.00750644\,\text{qGeV}^{10}-$
$\qquad 0.02882\,\text{qGeV}^{12}+0.0542949\,\text{qGeV}^{14}-0.0391312\,\text{qGeV}^{16}+$
$\qquad 2.85454\times10^{-8}\,\text{qGeV}^{18}-5.29822\times10^{-15}\,\text{qGeV}^{20}+$
$\qquad \text{MWIMP}\,\big(-1.00959\times10^{-11}+1.2279\times10^{-9}\,\text{qGeV}^2-5.77034\times10^{-8}\,\text{qGeV}^4+$
$\qquad 1.34998\times10^{-6}\,\text{qGeV}^6-0.0000172085\,\text{qGeV}^8+0.000122142$
$\qquad \text{qGeV}^{10}-0.000468947\,\text{qGeV}^{12}+0.000883464$
$\qquad \text{qGeV}^{14}-0.000636727\,\text{qGeV}^{16}+4.64479\times10^{-10}\,\text{qGeV}^{18}-$
$\qquad 8.62104\times10^{-17}\,\text{qGeV}^{20}\big)+\text{MWIMP}^2\,\big(-1.94531\times10^{-14}+$
$\qquad 3.2447\times10^{-12}\,\text{qGeV}^2-1.7694\times10^{-10}\,\text{qGeV}^4+4.51244\times10^{-9}$
$\qquad \text{qGeV}^6-6.10853\times10^{-8}\,\text{qGeV}^8+4.55578\times10^{-7}\,\text{qGeV}^{10}-$
$\qquad 1.83135\times10^{-6}\,\text{qGeV}^{12}+3.59384\times10^{-6}\,\text{qGeV}^{14}-2.59014\times10^{-6}$
$\qquad \text{qGeV}^{16}+1.88945\times10^{-12}\,\text{qGeV}^{18}-3.50695\times10^{-19}\,\text{qGeV}^{20}\big)\big)+$
$\text{MWIMP}^2\,\big(\text{c3p}^2\,\big(6.99714\times10^{-18}-1.8218\times10^{-15}\,\text{qGeV}^2+1.06385\times10^{-13}$

$$` \qquad ` \qquad \text{qGeV}^4 + 3.472\times10^{-12}\,\text{qGeV}^6 - 5.42186\times10^{-11}$$
$$\text{qGeV}^8 - 3.13342\times10^{-9}\,\text{qGeV}^{10} + 7.13578\times10^{-8}$$
$$\text{qGeV}^{12} - 4.78634\times10^{-7}\,\text{qGeV}^{14} + 1.02743\times10^{-6}$$
$$\text{qGeV}^{16} - 1.15907\times10^{-11}\,\text{qGeV}^{18} + 3.44247\times10^{-17}\,\text{qGeV}^{20}\big) +$$
$$\text{c3n c3p}\,\big(5.4509\times10^{-16} - 1.57197\times10^{-13}\,\text{qGeV}^2 + 1.30344\times10^{-11}$$
$$\text{qGeV}^4 - 1.74485\times10^{-10}\,\text{qGeV}^6 - 1.21214\times10^{-8}\,\text{qGeV}^8 +$$
$$4.61413\times10^{-7}\,\text{qGeV}^{10} - 6.17207\times10^{-6}\,\text{qGeV}^{12} + 0.0000352501$$
$$\text{qGeV}^{14} - 0.0000714095\,\text{qGeV}^{16} - 6.43169\times10^{-6}$$
$$\text{qGeV}^{18} + 3.71634\times10^{-11}\,\text{qGeV}^{20}\big) + \text{c3n}^2\,\big(1.06159\times10^{-14} -$$
$$3.35899\times10^{-12}\,\text{qGeV}^2 + 3.95753\times10^{-10}\,\text{qGeV}^4 - 2.25197\times10^{-8}$$
$$\text{qGeV}^6 + 7.13318\times10^{-7}\,\text{qGeV}^8 - 0.0000128204\,\text{qGeV}^{10} +$$
$$0.00012755\,\text{qGeV}^{12} - 0.000644458\,\text{qGeV}^{14} + 0.00125968$$
$$\text{qGeV}^{16} + 0.000224957\,\text{qGeV}^{18} + 0.000010179\,\text{qGeV}^{20}\big) +$$
$$\text{c4n}^2\,\big(7.16421\times10^{-10} - 1.02959\times10^{-7}\,\text{qGeV}^2 + 5.87602\times10^{-6}$$
$$\text{qGeV}^4 - 0.000173503\,\text{qGeV}^6 + 0.00292768\,\text{qGeV}^8 -$$
$$0.0293184\,\text{qGeV}^{10} + 0.17398\,\text{qGeV}^{12} - 0.585289\,\text{qGeV}^{14} +$$
$$0.995318\,\text{qGeV}^{16} - 0.654016\,\text{qGeV}^{18} + 0.141988\,\text{qGeV}^{20}\big)\big) +$$
$$\text{c2n}\,\big(\text{MWIMP}^2\,\big(\text{c3p}\,\big(-3.81005\times10^{-10} + 4.27984\times10^{-8}\,\text{qGeV}^2 -$$
$$1.85189\times10^{-6}\,\text{qGeV}^4 + 0.0000403448\,\text{qGeV}^6 -$$
$$0.00048339\,\text{qGeV}^8 + 0.00323765\,\text{qGeV}^{10} -$$
$$0.0115462\,\text{qGeV}^{12} + 0.0185453\,\text{qGeV}^{14} -$$
$$0.00700715\,\text{qGeV}^{16} + 6.07811\times10^{-9}\,\text{qGeV}^{18}\big) + \text{c3n}$$
$$\big(-5.28318\times10^{-10} + 6.60916\times10^{-8}\,\text{qGeV}^2 - 3.23941\times10^{-6}$$
$$\text{qGeV}^4 + 0.0000809848\,\text{qGeV}^6 - 0.00113698\,\text{qGeV}^8 +$$
$$0.00926279\,\text{qGeV}^{10} - 0.0433167\,\text{qGeV}^{12} + 0.109209$$
$$\text{qGeV}^{14} - 0.12622\,\text{qGeV}^{16} + 0.042079\,\text{qGeV}^{18}\big)\big) +$$
$$\text{c2p}\,\big(-1.76936\times10^{-9} + 2.34737\times10^{-7}\,\text{qGeV}^2 - 0.0000122046$$
$$\text{qGeV}^4 + 0.000322569\,\text{qGeV}^6 - 0.00476742\,\text{qGeV}^8 +$$
$$0.0406411\,\text{qGeV}^{10} - 0.197183\,\text{qGeV}^{12} + 0.509191\,\text{qGeV}^{14} -$$
$$0.592315\,\text{qGeV}^{16} + 0.197765\,\text{qGeV}^{18} - 7.23519\times10^{-8}$$
$$\text{qGeV}^{20} + \text{MWIMP}\,\big(-2.87903\times10^{-11} + 3.81955\times10^{-9}\,\text{qGeV}^2 -$$
$$1.98588\times10^{-7}\,\text{qGeV}^4 + 5.24872\times10^{-6}\,\text{qGeV}^6 -$$
$$0.0000775734\,\text{qGeV}^8 + 0.000661295\,\text{qGeV}^{10} -$$
$$0.00320848\,\text{qGeV}^{12} + 0.00828534\,\text{qGeV}^{14} -$$
$$0.00963791\,\text{qGeV}^{16} + 0.00321795\,\text{qGeV}^{18} -$$
$$1.17728\times10^{-9}\,\text{qGeV}^{20}\big) + \text{MWIMP}^2\,\big(9.91679\times10^{-14} -$$
$$2.59554\times10^{-12}\,\text{qGeV}^2 - 1.25342\times10^{-10}\,\text{qGeV}^4 +$$
$$7.43566\times10^{-9}\,\text{qGeV}^6 - 1.60275\times10^{-7}\,\text{qGeV}^8 +$$
$$1.80648\times10^{-6}\,\text{qGeV}^{10} - 0.0000109671\,\text{qGeV}^{12} +$$
$$0.000033146\,\text{qGeV}^{14} - 0.000039206\,\text{qGeV}^{16} +$$
$$0.0000130903\,\text{qGeV}^{18} - 4.78906\times10^{-12}\,\text{qGeV}^{20}\big)\big)\big)\big)\big)$$

$$\Big(-0.190236\,\mathbb{e}^{\frac{30.7289\,(0.190236\,\text{MWIMP}-122.914\,\text{qGeV}-1.\,\text{MWIMP}\,\text{qGeV})^2}{\text{MWIMP}^2}}\,\text{MWIMP} - 0.190236$$

$$\mathbb{e}^{\frac{30.7289\,(0.190236\,\text{MWIMP}+122.914\,\text{qGeV}+1.\,\text{MWIMP}\,\text{qGeV})^2}{\text{MWIMP}^2}}\,\text{MWIMP} +$$

$$122.914\,\mathbb{e}^{\frac{30.7289\,(0.190236\,\text{MWIMP}-122.914\,\text{qGeV}-1.\,\text{MWIMP}\,\text{qGeV})^2}{\text{MWIMP}^2}}\,\text{qGeV} -$$

$$122.914\,\mathbb{e}^{\frac{30.7289\,(0.190236\,\text{MWIMP}+122.914\,\text{qGeV}+1.\,\text{MWIMP}\,\text{qGeV})^2}{\text{MWIMP}^2}}\,\text{qGeV} +$$

$$1.\,\mathbb{e}^{\frac{30.7289\,(0.190236\,\text{MWIMP}-122.914\,\text{qGeV}-1.\,\text{MWIMP}\,\text{qGeV})^2}{\text{MWIMP}^2}}\,\text{MWIMP}\,\text{qGeV} -$$

$$1.\,\mathbb{e}^{\frac{30.7289\,(0.190236\,\text{MWIMP}+122.914\,\text{qGeV}+1.\,\text{MWIMP}\,\text{qGeV})^2}{\text{MWIMP}^2}}\,\text{MWIMP}\,\text{qGeV} -$$

$$4.76555\,\mathbb{e}^{\left(61.4577+\frac{928489.}{\text{MWIMP}^2}+\frac{15108.}{\text{MWIMP}}\right)}\,\text{qGeV}^2\,\text{MWIMP}$$

$$\mathrm{Erf}\left[1.05455 + \left(-5.54336 - \frac{681.355}{\mathrm{MWIMP}}\right)\mathrm{qGeV}\right] -$$

$$4.76555\, e^{\left(61.4577 + \frac{928489.}{\mathrm{MWIMP}^2} + \frac{15108.}{\mathrm{MWIMP}}\right)\mathrm{qGeV}^2}\, \mathrm{MWIMP}$$

$$\mathrm{Erf}\left[1.05455 + 5.54336\,\mathrm{qGeV} + \frac{681.355\,\mathrm{qGeV}}{\mathrm{MWIMP}}\right]\Big)\Big)$$

In[440]:= **fdRdE[q_] := dRdE /. qGeV → q;**

In[441]:= **fdRdE[0.1] GeV * 2500 KilogramDay /. MWIMP → (150 (*GeV*))**

Out[441]= 1.42103×10^9

$\big(0.000505338\,\big(0.181939\,\mathrm{c1n\,c2n} + 0.147431\,\mathrm{c1p\,c2n} + 3.65477\times10^{-7}\,\mathrm{c2n}^2 + 0.147431\,\mathrm{c1n\,c2p} +$
$\qquad 0.119468\,\mathrm{c1p\,c2p} + 2.24333\,\mathrm{c2n\,c2p} - 4.7203\times10^{-8}\,\mathrm{c2p}^2 -$
$\qquad 0.000244946\,\mathrm{c2n\,c3n} - 0.000198511\,\mathrm{c2p\,c3n} +$
$\qquad 1.09473\times10^{-10}\,\mathrm{c3n}^2 - 0.000207532\,\mathrm{c2n\,c3p} - 0.000168179\,\mathrm{c2p\,c3p} +$
$\qquad 4.29074\times10^{-11}\,\mathrm{c3n\,c3p} + 4.25809\times10^{-12}\,\mathrm{c3p}^2 + 0.000258332\,\mathrm{c4n}^2\big) +$
$\quad 344.948\,\big(0. + 0.0909694\,\mathrm{c1n}^2 + 0.147431\,\mathrm{c1n\,c1p} + 0.059734\,\mathrm{c1p}^2 -$
$\qquad 9.96628\times10^{-8}\,\mathrm{c1n\,c2n} - 8.07599\times10^{-8}\,\mathrm{c1p\,c2n} - 2.27498\times10^{-13}\,\mathrm{c2n}^2 -$
$\qquad 8.07599\times10^{-8}\,\mathrm{c1n\,c2p} - 6.54424\times10^{-8}\,\mathrm{c1p\,c2p} - 5.65274\times10^{-14}\,\mathrm{c2n\,c2p} +$
$\qquad 7.93289\times10^{-15}\,\mathrm{c2p}^2 - 0.000244958\,\mathrm{c1n\,c3n} - 0.000198513\,\mathrm{c1p\,c3n} +$
$\qquad 1.34177\times10^{-10}\,\mathrm{c2n\,c3n} + 1.08741\times10^{-10}\,\mathrm{c2p\,c3n} + 1.65438\times10^{-7}\,\mathrm{c3n}^2 -$
$\qquad 0.000207534\,\mathrm{c1n\,c3p} - 0.000168179\,\mathrm{c1p\,c3p} + 1.13682\times10^{-10}\,\mathrm{c2n\,c3p} +$
$\qquad 9.21252\times10^{-11}\,\mathrm{c2p\,c3p} + 2.79926\times10^{-7}\,\mathrm{c3n\,c3p} + 1.18485\times10^{-7}\,\mathrm{c3p}^2 +$
$\qquad 5.18934\times10^{-10}\,\mathrm{c4n}^2 - 6.15222\times10^{-10}\,\mathrm{c4n\,c4p} + 4.38721\times10^{-10}\,\mathrm{c4p}^2\big)\big)$

In[442]:= **fdRdE[0.1] GeV * 2500 KilogramDay /. MWIMP → (150 (*GeV*)) /.**
 {c1p → 1, c1n → 1, c2p → 1, c2n → 1, c3p → 1, c3n → 1, c4p → 1, c4n → 1}

Out[442]= 1.45738×10^{11}

In[443]:= **fplot = Simplify[fdRdE[q] GeV /. MWIMP → (150 (*GeV*)) /.**
 {c1p → 1, c1n → 1, c2p → 1, c2n → 1, c3p → 1, c3n → 1, c4p → 1, c4n → 1}, GeV > 0]

Out[443]= $7.7194\times10^{-51}\, e^{-67.4762\,q^2}$

$\big(-1.0185\times10^6\,\big(-0.000938992 + 0.126594\,q^2 - 6.73428\,q^4 + 183.884\,q^6 - 2847.16\,q^8 + 25956.3\,q^{10} -$
$\qquad 139086.\,q^{12} + 419001.\,q^{14} - 632970.\,q^{16} + 366526.\,q^{18} - 69850.3\,q^{20} +$
$\qquad 2.73598\,q^{22} + 1.\,q^{24}\big)\,(\mathrm{Erf}[1.05455 - 10.0857\,q] + \mathrm{Erf}[1.05455 + 10.0857\,q]) +$
$\quad 0.000733832\,\big(2.96036 - 398.653\,q^2 + 21174.1\,q^4 - 576916.\,q^6 + 8.90401\times10^6\,q^8 -$
$\qquad 8.07672\times10^7\,q^{10} + 4.29098\times10^8\,q^{12} - 1.27136\times10^9\,q^{14} +$
$\qquad 1.84529\times10^9\,q^{16} - 9.22483\times10^8\,q^{18} + 7.8763\times10^7\,q^{20} + 2.87714\times10^7\,q^{22}\big)$
$\quad\big(0.267504\,\big(e^{-101.722\,(0.104558 + 1.\,q)^2}\,(1.05455 - 10.0857\,q) +$
$\qquad\qquad e^{-101.722\,(0.104558 - 1.\,q)^2}\,(1.05455 + 10.0857\,q)\big) +$
$\qquad 0.764342\,(\mathrm{Erf}[1.05455 - 10.0857\,q] + \mathrm{Erf}[1.05455 + 10.0857\,q])\big)\big)$

In[444]:= `Plot[fplot, {q, 0, 0.2}]`
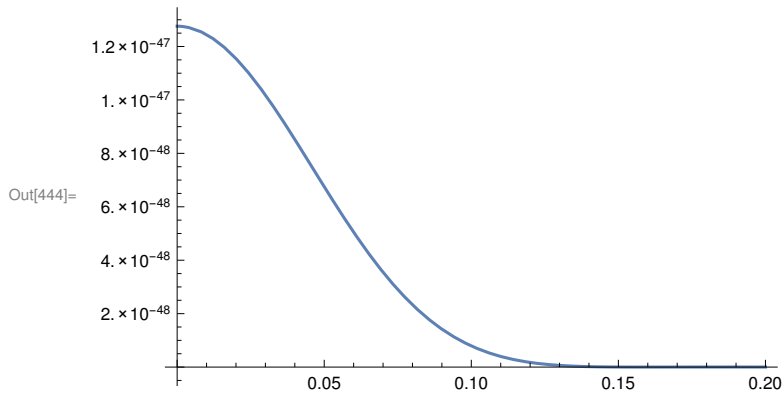
Out[444]=

Total predicted number of events for 150 GeV WIMP

In[445]:= `2500 KilogramDay *`
`NIntegrate[fdRdE[qGeV] GeV * (qGeV GeV / (131 mNucleon )) /. MWIMP → (150 (*GeV*)) /.`
`{c1p → 1, c1n → 1, c2p → 1, c2n → 1, c3p → 1, c3n → 1, c4p → 1, c4n → 1}, {qGeV, 0, 10}]`

Out[445]= 3.55356×10^7

Total predicted number of events as function of WIMP mass

In[446]:= `Plot[2500 KilogramDay *`
`NIntegrate[fdRdE[qGeV] GeV * (qGeV GeV / (131 mNucleon )) /. MWIMP → (M (*GeV*)) /.`
`{c1p → 1, c1n → 1, c2p → 1, c2n → 1, c3p → 1, c3n → 1, c4p → 1, c4n → 1},`
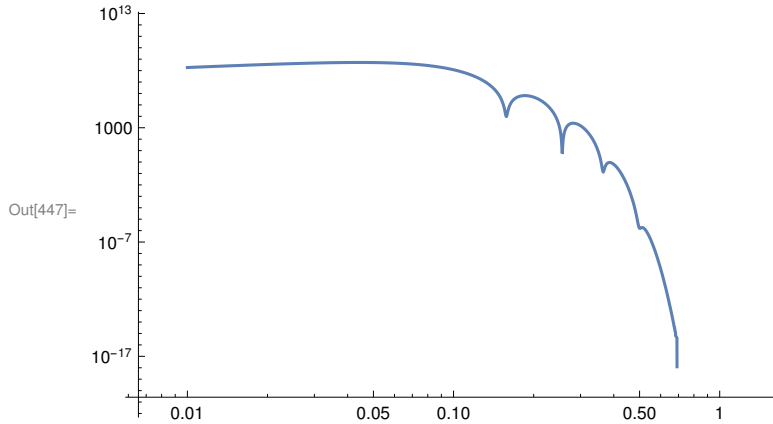`{qGeV, 0, 10}], {M, 0, 500}]`

Out[446]=
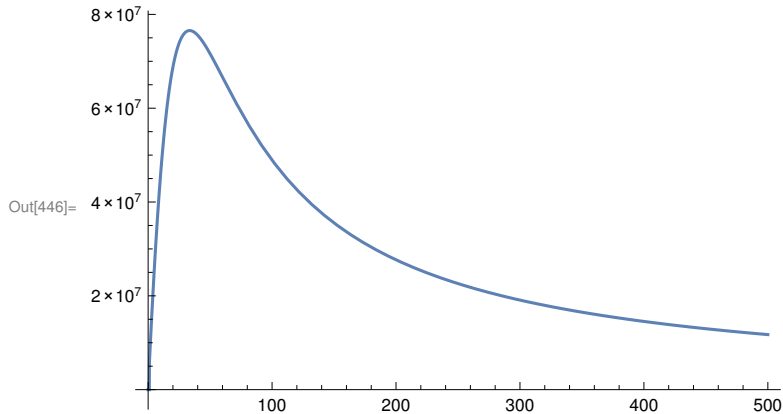
Recoil spectra for 150 GeV WIMP, for one coupling at a time (coupling values still set to 1)

Note units of $\frac{dR_D}{dE_R}$ are "event rate per unit time, per unit detector mass, per unit recoil energy"

In[447]:= `(*as function of q *)`
`LogLogPlot[2500 KilogramDay *fdRdE[qGeV] GeV *(qGeV GeV/(131 mNucleon ))/.`
`    MWIMP → (150 (*GeV*))/.`
`  {c1p → 1, c1n → 1, c2p → 1, c2n → 1, c3p → 1, c3n → 1, c4p → 1, c4n → 1}, {qGeV, 0.01, 1}]`

Out[447]=

Note: E_R = q^2 / 2mT
i.e. q = sqrt(2*mT*E_R)

In[448]:= `(*as function of E_R *)`
`mT  = 131 mNucleon ;`
`2500 KilogramDay *fdRdE[√(2 mT  ER/GeV)] GeV /. MWIMP → (150 (*GeV*))/.`
`  {c1p → 1, c1n → 1, c2p → 1, c2n → 1, c3p → 1, c3n → 1, c4p → 1, c4n → 1}`

Out[449]= $1.42103 \times 10^9 \left(646.112\, e^{-16582.7\,\text{ER}} \right.$

$\left(1.48018 - 49042.1\,\text{ER} + 6.41138 \times 10^8\,\text{ER}^2 - 4.30239 \times 10^{12}\,\text{ER}^3 + 1.63712 \times 10^{16}\,\text{ER}^4 - \right.$
$\left. 3.66789 \times 10^{19}\,\text{ER}^5 + 4.83017 \times 10^{22}\,\text{ER}^6 - 3.57599 \times 10^{25}\,\text{ER}^7 + 1.3276 \times 10^{28}\,\text{ER}^8 - \right.$
$\left. 1.88927 \times 10^{30}\,\text{ER}^9 + 8.84835 \times 10^{31}\,\text{ER}^{10} - 8.51747 \times 10^{29}\,\text{ER}^{11} - 7.65072 \times 10^{31}\,\text{ER}^{12}\right)$
$\left(\text{Erf}\left[1.05455 - 158.11\sqrt{\text{ER}}\right] + \text{Erf}\left[1.05455 + 158.11\sqrt{\text{ER}}\right]\right) +$
$0.000733832\, e^{-16582.7\,\text{ER}} \left(2.96036 - 97971.3\,\text{ER} + 1.27883 \times 10^9\,\text{ER}^2 - 8.56299 \times 10^{12}\,\text{ER}^3 + \right.$
$\left. 3.2479 \times 10^{16}\,\text{ER}^4 - 7.24029 \times 10^{19}\,\text{ER}^5 + 9.45324 \times 10^{22}\,\text{ER}^6 - 6.88329 \times 10^{25}\,\text{ER}^7 + \right.$
$\left. 2.45526 \times 10^{28}\,\text{ER}^8 - 3.01645 \times 10^{30}\,\text{ER}^9 + 6.32942 \times 10^{31}\,\text{ER}^{10} + 5.68207 \times 10^{33}\,\text{ER}^{11}\right)$
$\left(0.267504\left(-e^{-\left(1.05455 + 158.11\sqrt{\text{ER}}\right)^2}\left(-1.05455 + 158.11\sqrt{\text{ER}}\right) + \right.\right.$
$\left. e^{-\left(1.05455 - 158.11\sqrt{\text{ER}}\right)^2}\left(1.05455 + 158.11\sqrt{\text{ER}}\right)\right) +$
$\left.\left. 0.764342\left(\text{Erf}\left[1.05455 - 158.11\sqrt{\text{ER}}\right] + \text{Erf}\left[1.05455 + 158.11\sqrt{\text{ER}}\right]\right)\right)\right)$

Note units of $\frac{dR_D}{dE_R}$ are "event rate per unit time, per unit detector mass, per unit recoil energy". Multiplying in the exposure in kilogram days gets "event rate per unit recoil energy"
Note also kinematic threshold $E_{R,max} = 2\frac{\mu_T^2 v^2}{m_T}$, with $\mu_T = \frac{m_\chi m_T}{m_\chi + m_T}$ (I assume).

```
In[755]:= (*as function of E_R *)
         mχ  = 150; (*GeV*)
         mT   = 131 mNucleon ;
```

$$\mu T = \frac{m\chi\ \text{GeV}\,\text{mT}}{m\chi\ \text{GeV} + \text{mT}};$$

$$\text{ERmax}\ \ = 2\,\frac{\mu T^2\,v^2}{\text{mT}}\Bigg/\text{GeV}\,/.\,v \rightarrow ve\,(*\text{just using earth speed to get rough number },$$

```
and get rid of GeV units for plotting*)
```

$$\text{arg} = 2500\,\text{KilogramDay}\,*\text{fdRdE}\Big[\sqrt{2\,\text{mT}\ \text{ER}/\text{GeV}}\Big]\,\text{GeV}\,/.\,\text{MWIMP} \rightarrow m\chi\ \ /.$$

```
          {c1p → 0, c1n → 0, c2p → 0, c2n → 0, c3p → 0, c3n → 0, c4p → 0, c4n → 1};
```

$$\text{LogLogPlot}\Big[10^3 * \text{arg} * 10^{-9}, \{\text{ER}, 10^{-9}, 0.1\}, \text{Frame} \rightarrow \text{True},$$
$$\text{FrameLabel} \rightarrow \{\text{"E}_R\ \text{(GeV)"}, \text{"dR}_D/\text{dE}_R\ \text{(N per keV)"}\},$$
$$\text{GridLines} \rightarrow \{\{\text{ERmax}\ \}, \{\}\}, \text{PlotLabel} \rightarrow \text{"test c4n"}\Big]$$

Out[758]= 0.0000444707
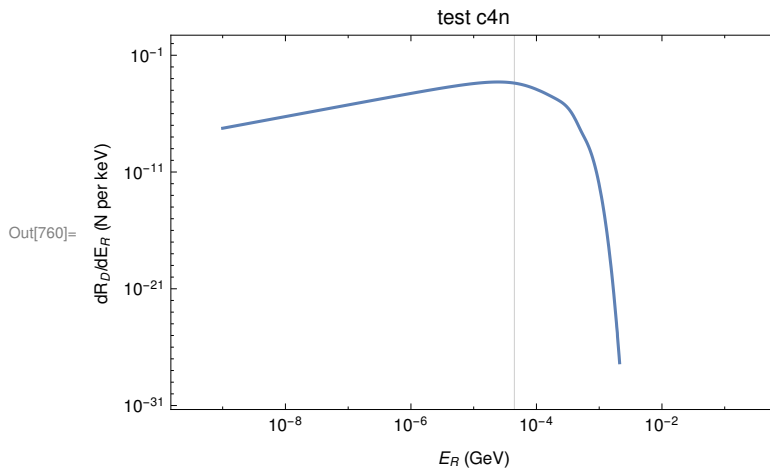

```
In[767]:= (* Grid *)
```

$$\text{arg} = 2500\,\text{KilogramDay}\,*\text{fdRdE}\Big[\sqrt{2\,\text{mT}\ \text{ER}/\text{GeV}}\Big]\,\text{GeV}\,/.\,\text{MWIMP} \rightarrow m\chi\ ;$$

```
         coefflist= {c1p, c1n, c2p, c2n, c3p, c3n, c4p, c4n};
         resttozero = {c1p → 0, c1n → 0, c2p → 0, c2n → 0, c3p → 0, c3n → 0, c4p → 0, c4n → 0};
         rules = Table[{coefflist〚i〛 → 1}, {i, 1, 8}];
         titles= Table[coefflist〚i〛, {i, 1, 8}];
         plots = Table[
```
$$\text{LogLogPlot}\Big[10^3 * \text{arg} * 10^{-9}/.\,\text{rules}〚i〛/.\,\text{resttozero}, \{\text{ER}, 10^{-9}, 0.1\},$$
$$\text{Frame} \rightarrow \text{True}, \text{FrameLabel} \rightarrow \{\text{"E}_R\ \text{(GeV)"}, \text{"dR}_D/\text{dE}_R\ \text{(N per keV)"}\},$$
$$\text{GridLines} \rightarrow \{\{\text{ERmax}\ \}, \{\}\}, \text{PlotLabel} \rightarrow \text{titles}〚i〛\Big], \{i, 1, 8\}\Big];$$

In[773]:= `GraphicsGrid[ArrayReshape[plots, {4, 2}], ImageSize → Full]`

Out[773]=