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SDECAY – A FORTRAN CODE FOR THE DECAYS OF SUPERSYMMETRIC PARTICLES IN THE MSSM

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The code can be obtained at the url:
http://people.web.psi.ch/muehlleitner/SDECAY

Outline

- Introduction
- The decays of the SUSY particles
- Structure and usage of the program
- Example for input and output
- Summary and outlook

Collaboration with: A.Djouadi,Y.Mambrini

Introduction

- SUSY particle properties: accuracy of a few % at the LHC and $\lesssim 1\%$ at future e^+e^- colliders

  $\Rightarrow$ Programs needed for the calculation of

  SUSY particle spectrum

  SUSY particle production cross sections

  SUSY particle decay widths and BR's

  with high precision, also including H.O. effects

- Existence of various tools desirable:
  - check of the programs
  - different implementations/approximations

  $\rightsquigarrow$ rough understanding of theor. errors

- On the market:

  Spectrum of SUSY particles: `ISASUSY` Baer,Paige,Protopopescu,Tata
  `SOFTSUSY` Allanach
  `SuSpect` Djouadi,Kneur,Moultaka
  `SPHENO` Porod ...

  Production cxn's and BR's: `ISASUSY`
  `(S)HERWIG` Corcella,...
  `SPYTHIA` Sjostrand,...;Mrenna,...
  `SUSYGEN` Katsavenas
  `PROSPINO` Beenakker,Kramer,Plehn,Spira
  `SPHENO` ...

$\boxed{\texttt{SDECAY}}$

Fortran code for the SUSY particle decays in the framework of R-parity conserving and real MSSM

- Mass spectrum and soft SUSY breaking parameters:
  - link to RGE program `SuSpect` Djouadi,Kneur,Moultaka
    easily to link to any other RGE code
  - New: via SUSY Les Houches Accord input file Skands et al.

- `SDECAY`: evaluation of SUSY particle couplings,
  calculation of decay widths and BR's

Decays of the SUSY particles

(i) Tree level 2-body decays

sfermions:

$$\tilde{f} \to \tilde{\chi} f \qquad \tilde{\chi}: \text{chargino, neutralino}$$
$$\tilde{f} \to \tilde{f} V \qquad V: W, Z$$
$$\tilde{f} \to \tilde{f} \Phi \qquad \Phi: h, H, A, H^{\pm}$$

squarks:

$$\tilde{q} \to \tilde{g} q$$

charginos/ neutralinos:

$$\tilde{\chi} \to \tilde{\chi} V$$
$$\tilde{\chi} \to \tilde{\chi} \Phi$$
$$\tilde{\chi} \to \tilde{f} f$$

gluino:

$$\tilde{g} \to \tilde{q} q$$

GMSB model:

$$\tilde{\chi}_1^0 \to \tilde{G}\gamma, \tilde{G}Z, \tilde{G}\Phi$$ Giudice,Rattazzi
$$\tilde{\tau}_1 \to \tilde{G}\tau$$

running b, t $\overline{\text{DR}}$ masses at EWSB scale in the Yukawa couplings

Option: QCD coupling constant and b, t Yukawa couplings at the scale of decaying SUSY particle or any other scale (only standard QCD corrections).

(ii) The QCD corrected 2-body decays

one-loop QCD corrections to

$\tilde{q} \rightarrow \tilde{\chi} q$ and $\tilde{\chi} \rightarrow \tilde{q} q$	Kraml et al. Djouadi,Hollik,Junger
$\tilde{q} \rightarrow \tilde{q}\Phi$	Arhrib et al. Bartl et al.
$\tilde{q} \rightarrow \tilde{q}V$	Bartl et al.
$\tilde{q} \rightarrow \tilde{g} q$ and $\tilde{g} \rightarrow \tilde{q} q$	Beenakker,Hopker,Plehn,Zerwas

- Corrections included in the $\overline{\text{DR}}$ scheme
- Bulk of EW corrs.: running gauge and third generation Yukawa couplings taken at the EWSB scale

(iii) loop induced decays

If 2-body decays are closed $\rightsquigarrow$ loop induced decays

$\tilde{\chi}_2^0 \rightarrow \tilde{\chi}_1^0 \gamma$	Haber,Wyler Ambrosanio,Mele Baer,Krupovnickas
$\tilde{g} \rightarrow \tilde{\chi}_1^0 g$	Ma,Wong Barbieri et al. Baer,Tata,Woodside
$\tilde{t}_1 \rightarrow \tilde{\chi}_1^0 c$	Hikasa,Kobayashi

(iv) Multibody decay modes

If 2-body decays are closed $\rightsquigarrow$ 3-body decays

gauginos:
$$\tilde{\chi} \to \tilde{\chi} f \bar{f}$$
$$\tilde{\chi} \to \tilde{g} q \bar{q}$$
Bartl,Majerotto,Porod
Baer et al.
Djouadi,Mambrini,MM

gluino:
$$\tilde{g} \to \tilde{\chi} q \bar{q}$$
$$\tilde{g} \to \tilde{t}_1 \bar{b} W^-$$ Porod
$$\tilde{g} \to \tilde{t}_1 \bar{b} H^-$$ Datta,Djouadi,Guchait,Mambrini

stops:
$$\tilde{t} \to bW^+\tilde{\chi}_1^0 \,,\ \tilde{t} \to bH^+\tilde{\chi}_1^0$$
$$\tilde{t} \to bl^+\tilde{\nu}_l,\ b\tilde{l}^+\nu_l$$
$$\tilde{t} \to \tilde{b} f \bar{f}'$$
$$\tilde{t}_2 \to \tilde{t}_1 f \bar{f}$$
Porod,Wohrmann
Datta,Guchait,Jeong
Djouadi,Guchait,Mambrini

sbottoms:
$$\tilde{b} \to tl^-\tilde{\nu}_l,\ t\tilde{l}^-\nu_l$$ Djouadi,Mambrini
$$\tilde{b} \to \tilde{t} f \bar{f}'$$
$$\tilde{b}_2 \to \tilde{b}_1 f \bar{f}$$

In 3-body decays:

- rad. corrected third generation Yukawa couplings
- mixing between sfermions taken into account
- masses of final state fermions included
- no total decay widths in propagators of virtual particles

If stop 3-body decays are closed $\rightsquigarrow$ $\tilde{t}_1$ 4-body decays

$$\tilde{t}_1 \to b\tilde{\chi}_1^0 f \bar{f}'$$ Boehm,Djouadi,Mambrini

(v) Top quark decays

Included in SDECAY:

$$\begin{aligned} t &\to bW^+ \\ t &\to bH^+ \quad \text{and} \quad \tilde{t}_1 \tilde{\chi}_1^0 \end{aligned}$$

Structure of SDECAY

files: SuSpect files or SD_leshouches.in ($\rightsquigarrow$ parameter setting)

- SDECAY files:

(i) sdecay.in: - options: QCD corrections, multibody and/ or loop decays, GMSB decays, top decays

- scale and # of loops for the running couplings
- option: read in input file in the SLHA

(ii) sdecay.f: - couplings of SUSY and Higgs particles evaluated

- decay branching ratios and total widths calculated

(iii) sdecay.out: - masses of SUSY and Higgs particles

- mixing matrices
- gauge and third generation Yukawa couplings at EWSB or chosen scale
- soft SUSY breaking param. at EWSB
- branching ratios and total widths

2 possible formats: simple transparent form or SLHA

New: subroutines and functions denoted by prefix SD_

Example for input and output file

SPS1a: $m_0 = 100$ GeV, $m_{1/2} = 250$ GeV, $A_0 = -100$ GeV, $\tan\beta = 10$, $\mu > 0$

The input file:

```
SDECAY INPUT FILE
-----------------

* Input parameters: Given by input file in the SUSY Les Houches Accord
  format (1) or given by Suspect (0):
1
* Choice of the output, Les Houches Accord (1) or simple (0):
1
* Include (1) or not (0) the QCD corrections to the 2-body decay widths:
0

* Include (1) or not (0) the multi-body decays for inos, stops, sbottoms:
1

* Include (1) or not (0) the loop induced decays for the gluino,
  the neutralinos and stop1:
1

* Include (1) or not (0) the SUSY decays of the top quark:
1

* Include (1) or not (0) the possible decays of the NLSP in GMSB models:
  (ichoice(1) has to be set 11 in suspect2.in.)
0

* Scheme in which the running alphas and quark masses are calculated
  if the scale is not the scale of EWSB:
  (If QCD corrections are included, the DR_bar scheme has to be used.)
  0 (MS_bar scheme) and 1 (DR_bar scheme).
1

* Scale at which the scale dependent couplings are calculated:
  1: EWSB scale, 2: mass of the decaying sparticle, 3: user choice
1

* Scale of the scale dependent couplings if chosen by the user (in GeV):
100.D0

* Number of loops for the calculation of the running couplings
2
```

Summary and outlook

SDECAY calculates

- 2-body decays of all SUSY particles + QCD corrections to the processes involving strongly interacting particles
- loop induced decays of neutralinos, gluino, $\tilde{t}_1$
- 3-body decays of neutralinos, charginos, gluino, stops, sbottoms
- 4-body decays of $\tilde{t}_1$
- top quark decays

New:
- finalization of QCD corrections to 2-body decays
- inclusion of bottom squark 3-body decays
- option: read in input file in the SUSY Les Houches accord
- subroutines and functions denoted by prefix SD_

Outlook:
- include QCD corrections to top quark
- spin correlations
- implementation of some important EW rad. corrs.

$\vdots$

Web page: http://people.web.psi.ch/muehlleitner/SDECAY

Output file according to SLHA

```
#                             ====================
#                             | THE SDECAY OUTPUT |
#                             ====================
#
#
#            ------------------------------------------------------
#            |  SUSY Les Houches Accord - MSSM Spectrum + Decays |
#            |                                                    |
#            |                    SDECAY 1.0                      |
#            |                                                    |
#            |  Authors: M.Muhlleitner, A.Djouadi and Y.Mambrini |
#            |  Ref.:    hep-ph/0311167                           |
#            |                                                    |
#            |  In case of problems please send an email to      |
#            |           margarete.muehlleitner@psich             |
#            |           djouadi@lpm.univ-montp2.fr               |
#            |           mambrini@delta.ft.uam.es                 |
#            |                                                    |
#            |  If not stated otherwise all DRbar couplings and  |
#            |  soft SUSY breaking masses are given at the scale |
#            |  Q=  0.48391963E+03                                |
#            |                                                    |
#            ------------------------------------------------------
#
#
BLOCK DCINFO  # Decay Program information
     1   SDECAY      # decay calculator
     2   1.0         # version number
#
BLOCK SPINFO  # Spectrum calculator information
     1   SPheno      # spectrum calculator
     2   2.2.0       # version number
#
BLOCK MODSEL  # Model selection
     1     1   mSUGRA
#
BLOCK MINPAR  # Input parameters
         1     1.00000000E+02   # m0
         2     2.50000000E+02   # m12
         3     1.00000000E+01   # tanb
```

```
         4     1.00000000E+00   # Sign(mu)
         5    -1.00000000E+02   # A0
         6     0.00000000E+00   #
#
BLOCK SMINPUTS  # Standard Model inputs
         1     0.00000000E+00   # alpha_em^-1(M_Z)^MSbar
         2     1.16639000E-05   # G_F [GeV^-2]
         3     1.17200000E-01   # alpha_S(M_Z)^MSbar
         4     9.11876000E+01   # M_Z pole mass
         5     4.25000000E+00   # mb(mb)^MSbar
         6     1.74300000E+02   # mt pole mass
         7     1.77700000E+00   # mtau pole mass
#
BLOCK MASS  # Mass Spectrum
# PDG code           mass       particle
        24     8.03944979E+01   # W+
        25     1.10808888E+02   # h
        35     3.99807034E+02   # H
        36     3.99429738E+02   # A
        37     4.07727445E+02   # H+
         5     4.87297771E+00   # b-quark pole mass calculated from mb(mb)_Msbar
   1000001     5.70647213E+02   # ~d_L
   2000001     5.47300689E+02   # ~d_R
   1000002     5.65241313E+02   # ~u_L
   2000002     5.47569179E+02   # ~u_R
   1000003     5.70647213E+02   # ~s_L
   2000003     5.47300689E+02   # ~s_R
   1000004     5.65241313E+02   # ~c_L
   2000004     5.47569179E+02   # ~c_R
   1000005     5.15125148E+02   # ~b_1
   2000005     5.47105875E+02   # ~b_2
   1000006     3.99453895E+02   # ~t_1
   2000006     5.86280284E+02   # ~t_2
   1000011     2.07124328E+02   # ~e_L
   2000011     1.43937924E+02   # ~e_R
   1000012     1.91279304E+02   # ~nu_eL
   1000013     2.07124328E+02   # ~mu_L
   2000013     1.43937924E+02   # ~mu_R
   1000014     1.91279304E+02   # ~nu_muL
   1000015     1.34843434E+02   # ~tau_1
```

```
   2000015     2.10680492E+02   # ~tau_2
   1000016     1.90385406E+02   # ~nu_tauL
   1000021     6.04021988E+02   # ~g
   1000022     9.71655613E+01   # ~chi_10
   1000023     1.80732549E+02   # ~chi_20
   1000025    -3.64666587E+02   # ~chi_30
   1000035     3.81926176E+02   # ~chi_40
   1000024     1.79732831E+02   # ~chi_1+
   1000037     3.82280312E+02   # ~chi_2+
#
BLOCK NMIX  # Neutralino Mixing Matrix
  1  1    -9.85759146E-01   # N_11
  1  2     5.61431949E-02   # N_12
  1  3    -1.48853698E-01   # N_13
  1  4     5.44924258E-02   # N_14
  2  1    -1.03914672E-01   # N_21
  2  2    -9.42753589E-01   # N_22
  2  3     2.74827334E-01   # N_23
  2  4    -1.57757245E-01   # N_24
  3  1     6.04836163E-02   # N_31
  3  2    -9.02611182E-02   # N_32
  3  3    -6.94837497E-01   # N_33
  3  4    -7.10911749E-01   # N_34
  4  1     1.17568616E-01   # N_41
  4  2    -3.16095782E-01   # N_42
  4  3    -6.47698514E-01   # N_43
  4  4     6.83189368E-01   # N_44
#
BLOCK UMIX  # Chargino Mixing Matrix U
  1  1    -9.17933954E-01   # U_11
  1  2     3.96733229E-01   # U_12
  2  1     3.96733229E-01   # U_21
  2  2     9.17933954E-01   # U_22
#
BLOCK VMIX  # Chargino Mixing Matrix V
  1  1    -9.71218062E-01   # V_11
  1  2     2.38192100E-01   # V_12
  2  1     2.38192100E-01   # V_21
  2  2     9.71218062E-01   # V_22
#
```

```
BLOCK STOPMIX  # Stop Mixing Matrix
  1  1     5.53404683E-01   # cos(theta_t)
  1  2     8.32912515E-01   # sin(theta_t)
  2  1    -8.32912515E-01   # -sin(theta_t)
  2  2     5.53404683E-01   # cos(theta_t)
#
BLOCK SBOTMIX  # Sbottom Mixing Matrix
  1  1     9.46969093E-01   # cos(theta_b)
  1  2     3.21324660E-01   # sin(theta_b)
  2  1    -3.21324660E-01   # -sin(theta_b)
  2  2     9.46969093E-01   # cos(theta_b)
#
BLOCK STAUMIX  # Stau Mixing Matrix
  1  1     2.64254410E-01   # cos(theta_tau)
  1  2     9.64453009E-01   # sin(theta_tau)
  2  1    -9.64453009E-01   # -sin(theta_tau)
  2  2     2.64254410E-01   # cos(theta_tau)
#
BLOCK ALPHA  # Higgs mixing
          -1.13954677E-01   # Mixing angle in the neutral Higgs boson sector
#
BLOCK HMIX Q=  4.83919634E+02  # DRbar Higgs Mixing Parameters
     1     3.57352995E+02   # mu(Q)
     2     1.00000000E+01   # tanbeta(Q)
     3     2.46000000E+02   # v(Q)
     4     0.00000000E+00   # M_A(Q)
#
BLOCK GAUGE Q=  4.83919634E+02  # The gauge couplings
     1     3.61193779E-01   # gprime(Q) DRbar
     2     6.46479958E-01   # g(Q) DRbar
     3     1.09493111E+00   # g3(Q) DRbar
#
BLOCK AU, AD, AE Q=  4.83919634E+02  # The trilinear couplings
  3  3    -4.96575993E+02   # A_t(Q) DRbar
  3  3    -7.90589211E+02   # A_b(Q) DRbar
  3  3    -2.51532920E+02   # A_tau(Q) DRbar
#
BLOCK Y_X,A_X Q=  4.83919634E+02  # The Yukawa couplings
  3  3     8.92107505E-01   # y_t(Q) DRbar
  3  3     1.37357260E-01   # y_b(Q) DRbar
```

```
  3  3     1.00322460E-01   # y_tau(Q) DRbar
#
BLOCK MSOFT Q=  4.83919634E+02  # The soft SUSY breaking masses at the scale Q
         1     1.01659572E+02   # M_1
         2     1.91760765E+02   # M_2
         3     5.84932779E+02   # M_3
        21     3.25303458E+04   # M^2_Hd
        22    -1.27842635E+05   # M^2_Hu
        31     1.95425198E+02   # M_eL
        32     1.95422281E+02   # M_muL
        33     1.94600935E+02   # M_tauL
        34     1.35796791E+02   # M_eR
        35     1.35788261E+02   # M_muR
        36     1.33369852E+02   # M_tauR
        41     5.44745129E+02   # M_q1L
        42     5.44743330E+02   # M_q2L
        43     4.96010956E+02   # M_q3L
        44     5.26046025E+02   # M_uR
        45     5.26044169E+02   # M_cR
        46     4.19681920E+02   # M_tR
        47     5.23905740E+02   # M_dR
        48     5.23903816E+02   # M_sR
        49     5.20718905E+02   # M_bR
#
#
#
#                             =================
#                             |The decay table|
#                             =================
#
# - The multi-body decays for the inos and sfermions are included.
#
# - The loop induced decays for the gluino, neutralinos and stops
#   are included.
#
# - The SUSY decays of the top quark are included.
#
#
#         PDG            Width
DECAY         6     1.50457964E+00   # top decays
```

```
#          BR          NDA      ID1       ID2
     1.00000000E+00    2           5        24   # BR(t ->  b    W+)
     0.00000000E+00    2           5        37   # BR(t ->  b    H+)
     0.00000000E+00    2     1000006   1000022   # BR(t -> ~t_1 ~chi_10)
     0.00000000E+00    2     1000006   1000023   # BR(t -> ~t_1 ~chi_20)
     0.00000000E+00    2     1000006   1000025   # BR(t -> ~t_1 ~chi_30)
     0.00000000E+00    2     1000006   1000035   # BR(t -> ~t_1 ~chi_40)
     0.00000000E+00    2     2000006   1000022   # BR(t -> ~t_2 ~chi_10)
     0.00000000E+00    2     2000006   1000023   # BR(t -> ~t_2 ~chi_20)
     0.00000000E+00    2     2000006   1000025   # BR(t -> ~t_2 ~chi_30)
     0.00000000E+00    2     2000006   1000035   # BR(t -> ~t_2 ~chi_40)
#
#         PDG            Width
DECAY   1000021     4.61131613E+00   # gluino decays
#          BR          NDA      ID1       ID2
     1.80367570E-02    2     1000001        -1   # BR(~g -> ~d_L  db)
     1.80367570E-02    2    -1000001         1   # BR(~g -> ~d_L* d )
     5.00468851E-02    2     2000001        -1   # BR(~g -> ~d_R  db)
     5.00468851E-02    2    -2000001         1   # BR(~g -> ~d_R* d )
     2.41293689E-02    2     1000002        -2   # BR(~g -> ~u_L  ub)
     2.41293689E-02    2    -1000002         2   # BR(~g -> ~u_L* u )
     4.95973373E-02    2     2000002        -2   # BR(~g -> ~u_R  ub)
     4.95973373E-02    2    -2000002         2   # BR(~g -> ~u_R* u )
     1.80367570E-02    2     1000003        -3   # BR(~g -> ~s_L  sb)
     1.80367570E-02    2    -1000003         3   # BR(~g -> ~s_L* s )
     5.00468851E-02    2     2000003        -3   # BR(~g -> ~s_R  sb)
     5.00468851E-02    2    -2000003         3   # BR(~g -> ~s_R* s )
     2.41293689E-02    2     1000004        -4   # BR(~g -> ~c_L  cb)
     2.41293689E-02    2    -1000004         4   # BR(~g -> ~c_L* c )
     4.95973373E-02    2     2000004        -4   # BR(~g -> ~c_R  cb)
     4.95973373E-02    2    -2000004         4   # BR(~g -> ~c_R* c )
     1.11830545E-01    2     1000005        -5   # BR(~g -> ~b_1  bb)
     1.11830545E-01    2    -1000005         5   # BR(~g -> ~b_1* b )
     5.29512983E-02    2     2000005        -5   # BR(~g -> ~b_2  bb)
     5.29512983E-02    2    -2000005         5   # BR(~g -> ~b_2* b )
     5.15974605E-02    2     1000006        -6   # BR(~g -> ~t_1  tb)
     5.15974605E-02    2    -1000006         6   # BR(~g -> ~t_1* t )
     0.00000000E+00    2     2000006        -6   # BR(~g -> ~t_2  tb)
     0.00000000E+00    2    -2000006         6   # BR(~g -> ~t_2* t )
#
```

```
#         PDG            Width
DECAY   1000006     2.05166768E+00   # stop1 decays
#          BR         NDA      ID1       ID2
     1.93696577E-01    2     1000022         6   # BR(~t_1 -> ~chi_10 t )
     1.17667028E-01    2     1000023         6   # BR(~t_1 -> ~chi_20 t )
     0.00000000E+00    2     1000025         6   # BR(~t_1 -> ~chi_30 t )
     0.00000000E+00    2     1000035         6   # BR(~t_1 -> ~chi_40 t )
     6.78525532E-01    2     1000024         5   # BR(~t_1 -> ~chi_1+ b )
     1.01108628E-02    2     1000037         5   # BR(~t_1 -> ~chi_2+ b )
     0.00000000E+00    2     1000021         6   # BR(~t_1 -> ~g      t )
     0.00000000E+00    2     1000005        37   # BR(~t_1 -> ~b_1    H+)
     0.00000000E+00    2     2000005        37   # BR(~t_1 -> ~b_2    H+)
     0.00000000E+00    2     1000005        24   # BR(~t_1 -> ~b_1    W+)
     0.00000000E+00    2     2000005        24   # BR(~t_1 -> ~b_2    W+)
#
#         PDG            Width
DECAY   2000006     7.36821884E+00   # stop2 decays
#          BR         NDA      ID1       ID2
     2.99471775E-02    2     1000022         6   # BR(~t_2 -> ~chi_10 t )
     8.66051324E-02    2     1000023         6   # BR(~t_2 -> ~chi_20 t )
     4.21453407E-02    2     1000025         6   # BR(~t_2 -> ~chi_30 t )
     1.96296800E-01    2     1000035         6   # BR(~t_2 -> ~chi_40 t )
     2.15895843E-01    2     1000024         5   # BR(~t_2 -> ~chi_1+ b )
     2.00144308E-01    2     1000037         5   # BR(~t_2 -> ~chi_2+ b )
     0.00000000E+00    2     1000021         6   # BR(~t_2 -> ~g      t )
     3.65536073E-02    2     1000006        25   # BR(~t_2 -> ~t_1    h )
     0.00000000E+00    2     1000006        35   # BR(~t_2 -> ~t_1    H )
     0.00000000E+00    2     1000006        36   # BR(~t_2 -> ~t_1    A )
     0.00000000E+00    2     1000005        37   # BR(~t_2 -> ~b_1    H+)
     0.00000000E+00    2     2000005        37   # BR(~t_2 -> ~b_2    H+)
     1.92411790E-01    2     1000006        23   # BR(~t_2 -> ~t_1    Z )
     0.00000000E+00    2     1000005        24   # BR(~t_2 -> ~b_1    W+)
     0.00000000E+00    2     2000005        24   # BR(~t_2 -> ~b_2    W+)
#
#         PDG            Width
DECAY   1000005     3.86232720E+00   # sbottom1 decays
#          BR         NDA      ID1       ID2
     4.31506893E-02    2     1000022         5   # BR(~b_1 -> ~chi_10 b )
     3.47475142E-01    2     1000023         5   # BR(~b_1 -> ~chi_20 b )
     5.07766983E-03    2     1000025         5   # BR(~b_1 -> ~chi_30 b )
```

```
     1.10113707E-02    2     1000035         5   # BR(~b_1 -> ~chi_40 b )
     4.47748056E-01    2    -1000024         6   # BR(~b_1 -> ~chi_1- t )
     0.00000000E+00    2    -1000037         6   # BR(~b_1 -> ~chi_2- t )
     0.00000000E+00    2     1000021         5   # BR(~b_1 -> ~g      b )
     0.00000000E+00    2     1000006       -37   # BR(~b_1 -> ~t_1    H-)
     0.00000000E+00    2     2000006       -37   # BR(~b_1 -> ~t_2    H-)
     1.45537072E-01    2     1000006       -24   # BR(~b_1 -> ~t_1    W-)
     0.00000000E+00    2     2000006       -24   # BR(~b_1 -> ~t_2    W-)
#
#         PDG            Width
DECAY   2000005     7.55887804E-01   # sbottom2 decays
#          BR         NDA      ID1       ID2
     3.17113382E-01    2     1000022         5   # BR(~b_2 -> ~chi_10 b )
     1.23100905E-01    2     1000023         5   # BR(~b_2 -> ~chi_20 b )
     5.57296638E-02    2     1000025         5   # BR(~b_2 -> ~chi_30 b )
     7.75287730E-02    2     1000035         5   # BR(~b_2 -> ~chi_40 b )
     1.64688663E-01    2    -1000024         6   # BR(~b_2 -> ~chi_1- t )
     0.00000000E+00    2    -1000037         6   # BR(~b_2 -> ~chi_2- t )
     0.00000000E+00    2     1000021         5   # BR(~b_2 -> ~g      b )
     0.00000000E+00    2     1000005        25   # BR(~b_2 -> ~b_1    h )
     0.00000000E+00    2     1000005        35   # BR(~b_2 -> ~b_1    H )
     0.00000000E+00    2     1000005        36   # BR(~b_2 -> ~b_1    A )
     0.00000000E+00    2     1000006       -37   # BR(~b_2 -> ~t_1    H-)
     0.00000000E+00    2     2000006       -37   # BR(~b_2 -> ~t_2    H-)
     0.00000000E+00    2     1000005        23   # BR(~b_2 -> ~b_1    Z )
     2.61838613E-01    2     1000006       -24   # BR(~b_2 -> ~t_1    W-)
     0.00000000E+00    2     2000006       -24   # BR(~b_2 -> ~t_2    W-)
#
#         PDG            Width
DECAY   1000002     5.51461615E+00   # sup_L decays
#          BR         NDA      ID1       ID2
     6.51766534E-03    2     1000022         2   # BR(~u_L -> ~chi_10 u)
     3.17906264E-01    2     1000023         2   # BR(~u_L -> ~chi_20 u)
     9.06244759E-04    2     1000025         2   # BR(~u_L -> ~chi_30 u)
     1.08925515E-02    2     1000035         2   # BR(~u_L -> ~chi_40 u)
     6.49541754E-01    2     1000024         1   # BR(~u_L -> ~chi_1+ d)
     1.42355195E-02    2     1000037         1   # BR(~u_L -> ~chi_2+ d)
     0.00000000E+00    2     1000021         2   # BR(~u_L -> ~g      u)
#
#         PDG            Width
```

```
DECAY   2000002     1.16832579E+00   # sup_R decays
#          BR          NDA      ID1       ID2
     9.85563724E-01    2     1000022         2   # BR(~u_R -> ~chi_10 u)
     9.27041142E-03    2     1000023         2   # BR(~u_R -> ~chi_20 u)
     1.22491684E-03    2     1000025         2   # BR(~u_R -> ~chi_30 u)
     3.94094746E-03    2     1000035         2   # BR(~u_R -> ~chi_40 u)
     0.00000000E+00    2     1000024         1   # BR(~u_R -> ~chi_1+ d)
     0.00000000E+00    2     1000037         1   # BR(~u_R -> ~chi_2+ d)
     0.00000000E+00    2     1000021         2   # BR(~u_R -> ~g      u)
#
#         PDG            Width
DECAY   1000001     5.32801931E+00   # sdown_L decays
#          BR          NDA      ID1       ID2
     2.41263508E-02    2     1000022         1   # BR(~d_L -> ~chi_10 d)
     3.07312425E-01    2     1000023         1   # BR(~d_L -> ~chi_20 d)
     1.60641531E-03    2     1000025         1   # BR(~d_L -> ~chi_30 d)
     1.55020797E-02    2     1000035         1   # BR(~d_L -> ~chi_40 d)
     6.08863727E-01    2    -1000024         2   # BR(~d_L -> ~chi_1- u)
     4.25890023E-02    2    -1000037         2   # BR(~d_L -> ~chi_2- u)
     0.00000000E+00    2     1000021         1   # BR(~d_L -> ~g      d)
#
#         PDG            Width
DECAY   2000001     2.91916525E-01   # sdown_R decays
#          BR          NDA      ID1       ID2
     9.85574117E-01    2     1000022         1   # BR(~d_R -> ~chi_10 d)
     9.26887613E-03    2     1000023         1   # BR(~d_R -> ~chi_20 d)
     1.22309234E-03    2     1000025         1   # BR(~d_R -> ~chi_30 d)
     3.93391500E-03    2     1000035         1   # BR(~d_R -> ~chi_40 d)
     0.00000000E+00    2    -1000024         2   # BR(~d_R -> ~chi_1- u)
     0.00000000E+00    2    -1000037         2   # BR(~d_R -> ~chi_2- u)
     0.00000000E+00    2     1000021         1   # BR(~d_R -> ~g      d)
#
#         PDG            Width
DECAY   1000004     5.51461615E+00   # scharm_L decays
#          BR          NDA      ID1       ID2
     6.51766534E-03    2     1000022         4   # BR(~c_L -> ~chi_10 c)
     3.17906264E-01    2     1000023         4   # BR(~c_L -> ~chi_20 c)
     9.06244759E-04    2     1000025         4   # BR(~c_L -> ~chi_30 c)
     1.08925515E-02    2     1000035         4   # BR(~c_L -> ~chi_40 c)
     6.49541754E-01    2     1000024         3   # BR(~c_L -> ~chi_1+ s)
```

```
     1.42355195E-02    2     1000037         3   # BR(~c_L -> ~chi_2+ s)
     0.00000000E+00    2     1000021         4   # BR(~c_L -> ~g      c)
#
#         PDG            Width
DECAY   2000004     1.16832579E+00   # scharm_R decays
#          BR         NDA      ID1       ID2
     9.85563724E-01    2     1000022         4   # BR(~c_R -> ~chi_10 c)
     9.27041142E-03    2     1000023         4   # BR(~c_R -> ~chi_20 c)
     1.22491684E-03    2     1000025         4   # BR(~c_R -> ~chi_30 c)
     3.94094746E-03    2     1000035         4   # BR(~c_R -> ~chi_40 c)
     0.00000000E+00    2     1000024         3   # BR(~c_R -> ~chi_1+ s)
     0.00000000E+00    2     1000037         3   # BR(~c_R -> ~chi_2+ s)
     0.00000000E+00    2     1000021         4   # BR(~c_R -> ~g      c)
#
#         PDG            Width
DECAY   1000003     5.32801931E+00   # sstrange_L decays
#          BR         NDA      ID1       ID2
     2.41263508E-02    2     1000022         3   # BR(~s_L -> ~chi_10 s)
     3.07312425E-01    2     1000023         3   # BR(~s_L -> ~chi_20 s)
     1.60641531E-03    2     1000025         3   # BR(~s_L -> ~chi_30 s)
     1.55020797E-02    2     1000035         3   # BR(~s_L -> ~chi_40 s)
     6.08863727E-01    2    -1000024         4   # BR(~s_L -> ~chi_1- c)
     4.25890023E-02    2    -1000037         4   # BR(~s_L -> ~chi_2- c)
     0.00000000E+00    2     1000021         3   # BR(~s_L -> ~g      s)
#
#         PDG            Width
DECAY   2000003     2.91916525E-01   # sstrange_R decays
#          BR         NDA      ID1       ID2
     9.85574117E-01    2     1000022         3   # BR(~s_R -> ~chi_10 s)
     9.26887613E-03    2     1000023         3   # BR(~s_R -> ~chi_20 s)
     1.22309234E-03    2     1000025         3   # BR(~s_R -> ~chi_30 s)
     3.93391500E-03    2     1000035         3   # BR(~s_R -> ~chi_40 s)
     0.00000000E+00    2    -1000024         4   # BR(~s_R -> ~chi_1- c)
     0.00000000E+00    2    -1000037         4   # BR(~s_R -> ~chi_2- c)
     0.00000000E+00    2     1000021         3   # BR(~s_R -> ~g      s)
#
#         PDG            Width
DECAY   1000011     2.65771989E-01   # selectron_L decays
#          BR         NDA      ID1       ID2
     4.82132079E-01    2     1000022        11   # BR(~e_L -> ~chi_10 e-)
```

```
     1.84753516E-01    2     1000023        11   # BR(~e_L -> ~chi_20 e-)
     0.00000000E+00    2     1000025        11   # BR(~e_L -> ~chi_30 e-)
     0.00000000E+00    2     1000035        11   # BR(~e_L -> ~chi_40 e-)
     3.33114405E-01    2    -1000024        12   # BR(~e_L -> ~chi_1- nu_e)
     0.00000000E+00    2    -1000037        12   # BR(~e_L -> ~chi_2- nu_e)
#
#         PDG            Width
DECAY   2000011     2.15100879E-01   # selectron_R decays
#          BR         NDA      ID1       ID2
     1.00000000E+00    2     1000022        11   # BR(~e_R -> ~chi_10 e-)
     0.00000000E+00    2     1000023        11   # BR(~e_R -> ~chi_20 e-)
     0.00000000E+00    2     1000025        11   # BR(~e_R -> ~chi_30 e-)
     0.00000000E+00    2     1000035        11   # BR(~e_R -> ~chi_40 e-)
     0.00000000E+00    2    -1000024        12   # BR(~e_R -> ~chi_1- nu_e)
     0.00000000E+00    2    -1000037        12   # BR(~e_R -> ~chi_2- nu_e)
#
#         PDG            Width
DECAY   1000013     2.65771989E-01   # smuon_L decays
#          BR         NDA      ID1       ID2
     4.82132079E-01    2     1000022        13   # BR(~mu_L -> ~chi_10 mu-)
     1.84753516E-01    2     1000023        13   # BR(~mu_L -> ~chi_20 mu-)
     0.00000000E+00    2     1000025        13   # BR(~mu_L -> ~chi_30 mu-)
     0.00000000E+00    2     1000035        13   # BR(~mu_L -> ~chi_40 mu-)
     3.33114405E-01    2    -1000024        14   # BR(~mu_L -> ~chi_1- nu_mu)
     0.00000000E+00    2    -1000037        14   # BR(~mu_L -> ~chi_2- nu_mu)
#
#         PDG            Width
DECAY   2000013     2.15100879E-01   # smuon_R decays
#          BR         NDA      ID1       ID2
     1.00000000E+00    2     1000022        13   # BR(~mu_R -> ~chi_10 mu-)
     0.00000000E+00    2     1000023        13   # BR(~mu_R -> ~chi_20 mu-)
     0.00000000E+00    2     1000025        13   # BR(~mu_R -> ~chi_30 mu-)
     0.00000000E+00    2     1000035        13   # BR(~mu_R -> ~chi_40 mu-)
     0.00000000E+00    2    -1000024        14   # BR(~mu_R -> ~chi_1- nu_mu)
     0.00000000E+00    2    -1000037        14   # BR(~mu_R -> ~chi_2- nu_mu)
#
#         PDG            Width
DECAY   1000015     1.50752468E-01   # stau_1 decays
#          BR         NDA      ID1       ID2
     1.00000000E+00    2     1000022        15   # BR(~tau_1 -> ~chi_10  tau-)
```

```
     0.00000000E+00    2     1000023        15   # BR(~tau_1 -> ~chi_20  tau-)
     0.00000000E+00    2     1000025        15   # BR(~tau_1 -> ~chi_30  tau-)
     0.00000000E+00    2     1000035        15   # BR(~tau_1 -> ~chi_40  tau-)
     0.00000000E+00    2    -1000024        16   # BR(~tau_1 -> ~chi_1-  nu_tau)
     0.00000000E+00    2    -1000037        16   # BR(~tau_1 -> ~chi_2-  nu_tau)
     0.00000000E+00    2     1000016       -37   # BR(~tau_1 -> ~nu_tauL H-)
     0.00000000E+00    2     1000016       -24   # BR(~tau_1 -> ~nu_tauL W-)
#
#         PDG            Width
DECAY   2000015     3.16117512E-01   # stau_2 decays
#          BR         NDA      ID1       ID2
     5.16378784E-01    2     1000022        15   # BR(~tau_2 -> ~chi_10  tau-)
     1.73523724E-01    2     1000023        15   # BR(~tau_2 -> ~chi_20  tau-)
     0.00000000E+00    2     1000025        15   # BR(~tau_2 -> ~chi_30  tau-)
     0.00000000E+00    2     1000035        15   # BR(~tau_2 -> ~chi_40  tau-)
     3.10097493E-01    2    -1000024        16   # BR(~tau_2 -> ~chi_1-  nu_tau)
     0.00000000E+00    2    -1000037        16   # BR(~tau_2 -> ~chi_2-  nu_tau)
     0.00000000E+00    2     1000016       -37   # BR(~tau_2 -> ~nu_tauL H-)
     0.00000000E+00    2     1000016       -24   # BR(~tau_2 -> ~nu_tauL W-)
     0.00000000E+00    2     1000015        25   # BR(~tau_2 -> ~tau_1   h)
     0.00000000E+00    2     1000015        35   # BR(~tau_2 -> ~tau_1   H)
     0.00000000E+00    2     1000015        36   # BR(~tau_2 -> ~tau_1   A)
     0.00000000E+00    2     1000015        23   # BR(~tau_2 -> ~tau_1   Z)
#
#         PDG            Width
DECAY   1000012     1.88960219E-01   # snu_eL decays
#          BR         NDA      ID1       ID2
     8.53286607E-01    2     1000022        12   # BR(~nu_eL -> ~chi_10 nu_e)
     3.78769448E-02    2     1000023        12   # BR(~nu_eL -> ~chi_20 nu_e)
     0.00000000E+00    2     1000025        12   # BR(~nu_eL -> ~chi_30 nu_e)
     0.00000000E+00    2     1000035        12   # BR(~nu_eL -> ~chi_40 nu_e)
     1.08836448E-01    2     1000024        11   # BR(~nu_eL -> ~chi_1+ e-)
     0.00000000E+00    2     1000037        11   # BR(~nu_eL -> ~chi_2+ e-)
#
#         PDG            Width
DECAY   1000014     1.88960219E-01   # snu_muL decays
#          BR         NDA      ID1       ID2
     8.53286607E-01    2     1000022        14   # BR(~nu_muL -> ~chi_10 nu_mu)
     3.78769448E-02    2     1000023        14   # BR(~nu_muL -> ~chi_20 nu_mu)
     0.00000000E+00    2     1000025        14   # BR(~nu_muL -> ~chi_30 nu_mu)
```

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     0.00000000E+00    2     1000035        14   # BR(~nu_muL -> ~chi_40 nu_mu)
     1.08836448E-01    2     1000024        13   # BR(~nu_muL -> ~chi_1+ mu-)
     0.00000000E+00    2     1000037        13   # BR(~nu_muL -> ~chi_2+ mu-)
#
#         PDG            Width
DECAY   1000016     1.82603291E-01   # snu_tauL decays
#          BR         NDA      ID1       ID2
     8.73120935E-01    2     1000022        16   # BR(~nu_tauL -> ~chi_10 nu_tau)
     3.31378341E-02    2     1000023        16   # BR(~nu_tauL -> ~chi_20 nu_tau)
     0.00000000E+00    2     1000025        16   # BR(~nu_tauL -> ~chi_30 nu_tau)
     0.00000000E+00    2     1000035        16   # BR(~nu_tauL -> ~chi_40 nu_tau)
     9.37412313E-02    2     1000024        15   # BR(~nu_tauL -> ~chi_1+ tau-)
     0.00000000E+00    2     1000037        15   # BR(~nu_tauL -> ~chi_2+ tau-)
     0.00000000E+00    2     1000015       -37   # BR(~nu_tauL -> ~tau_1+ H-)
     0.00000000E+00    2     2000015       -37   # BR(~nu_tauL -> ~tau_2+ H-)
     0.00000000E+00    2     1000015       -24   # BR(~nu_tauL -> ~tau_1+ W-)
     0.00000000E+00    2     2000015       -24   # BR(~nu_tauL -> ~tau_2+ W-)
#
#         PDG            Width
DECAY   1000024     1.35685772E-02   # chargino1+ decays
#          BR         NDA      ID1       ID2
     0.00000000E+00    2     1000002        -1   # BR(~chi_1+ -> ~u_L     db)
     0.00000000E+00    2     2000002        -1   # BR(~chi_1+ -> ~u_R     db)
     0.00000000E+00    2    -1000001         2   # BR(~chi_1+ -> ~d_L*    u )
     0.00000000E+00    2    -2000001         2   # BR(~chi_1+ -> ~d_R*    u )
     0.00000000E+00    2     1000004        -3   # BR(~chi_1+ -> ~c_L     sb)
     0.00000000E+00    2     2000004        -3   # BR(~chi_1+ -> ~c_R     sb)
     0.00000000E+00    2    -1000003         4   # BR(~chi_1+ -> ~s_L*    c )
     0.00000000E+00    2    -2000003         4   # BR(~chi_1+ -> ~s_R*    c )
     0.00000000E+00    2     1000006        -5   # BR(~chi_1+ -> ~t_1     bb)
     0.00000000E+00    2     2000006        -5   # BR(~chi_1+ -> ~t_2     bb)
     0.00000000E+00    2    -1000005         6   # BR(~chi_1+ -> ~b_1*    t )
     0.00000000E+00    2    -2000005         6   # BR(~chi_1+ -> ~b_2*    t )
     0.00000000E+00    2     1000012       -11   # BR(~chi_1+ -> ~nu_eL   e+  )
     0.00000000E+00    2     1000014       -13   # BR(~chi_1+ -> ~nu_muL  mu+ )
     0.00000000E+00    2     1000016       -15   # BR(~chi_1+ -> ~nu_tau1 tau+)
     0.00000000E+00    2    -1000011        12   # BR(~chi_1+ -> ~e_L+    nu_e)
     0.00000000E+00    2    -2000011        12   # BR(~chi_1+ -> ~e_R+    nu_e)
     0.00000000E+00    2    -1000013        14   # BR(~chi_1+ -> ~mu_L+   nu_mu)
     0.00000000E+00    2    -2000013        14   # BR(~chi_1+ -> ~mu_R+   nu_mu)
```

```
     9.59380537E-01    2    -1000015          16   # BR(~chi_1+ -> ~tau_1+  nu_tau)
     0.00000000E+00    2    -2000015          16   # BR(~chi_1+ -> ~tau_2+  nu_tau)
     4.06194628E-02    2     1000022          24   # BR(~chi_1+ -> ~chi_10  W+)
     0.00000000E+00    2     1000023          24   # BR(~chi_1+ -> ~chi_20  W+)
     0.00000000E+00    2     1000025          24   # BR(~chi_1+ -> ~chi_30  W+)
     0.00000000E+00    2     1000035          24   # BR(~chi_1+ -> ~chi_40  W+)
     0.00000000E+00    2     1000022          37   # BR(~chi_1+ -> ~chi_10  H+)
     0.00000000E+00    2     1000023          37   # BR(~chi_1+ -> ~chi_20  H+)
     0.00000000E+00    2     1000025          37   # BR(~chi_1+ -> ~chi_30  H+)
     0.00000000E+00    2     1000035          37   # BR(~chi_1+ -> ~chi_40  H+)
#
#         PDG            Width
DECAY   1000037     2.50174306E+00   # chargino2+ decays
#          BR         NDA      ID1       ID2
     0.00000000E+00    2     1000002          -1   # BR(~chi_2+ -> ~u_L     db)
     0.00000000E+00    2     2000002          -1   # BR(~chi_2+ -> ~u_R     db)
     0.00000000E+00    2    -1000001           2   # BR(~chi_2+ -> ~d_L*    u )
     0.00000000E+00    2    -2000001           2   # BR(~chi_2+ -> ~d_R*    u )
     0.00000000E+00    2     1000004          -3   # BR(~chi_2+ -> ~c_L     sb)
     0.00000000E+00    2     2000004          -3   # BR(~chi_2+ -> ~c_R     sb)
     0.00000000E+00    2    -1000003           4   # BR(~chi_2+ -> ~s_L*    c )
     0.00000000E+00    2    -2000003           4   # BR(~chi_2+ -> ~s_R*    c )
     0.00000000E+00    2     1000006          -5   # BR(~chi_2+ -> ~t_1     bb)
     0.00000000E+00    2     2000006          -5   # BR(~chi_2+ -> ~t_2     bb)
     0.00000000E+00    2    -1000005           6   # BR(~chi_2+ -> ~b_1*    t )
     0.00000000E+00    2    -2000005           6   # BR(~chi_2+ -> ~b_2*    t )
     2.02537263E-02    2     1000012         -11   # BR(~chi_2+ -> ~nu_eL   e+  )
     2.02537263E-02    2     1000014         -13   # BR(~chi_2+ -> ~nu_muL  mu+ )
     2.73670639E-02    2     1000016         -15   # BR(~chi_2+ -> ~nu_tau1 tau+)
     4.98994770E-02    2    -1000011          12   # BR(~chi_2+ -> ~e_L+    nu_e)
     0.00000000E+00    2    -2000011          12   # BR(~chi_2+ -> ~e_R+    nu_e)
     4.98994770E-02    2    -1000013          14   # BR(~chi_2+ -> ~mu_L+   nu_mu)
     0.00000000E+00    2    -2000013          14   # BR(~chi_2+ -> ~mu_R+   nu_mu)
     5.15842083E-04    2    -1000015          16   # BR(~chi_2+ -> ~tau_1+  nu_tau)
     5.43964061E-02    2    -2000015          16   # BR(~chi_2+ -> ~tau_2+  nu_tau)
     2.45391275E-01    2     1000024          23   # BR(~chi_2+ -> ~chi_1+  Z )
     6.81700926E-02    2     1000022          24   # BR(~chi_2+ -> ~chi_10  W+)
     2.84587441E-01    2     1000023          24   # BR(~chi_2+ -> ~chi_20  W+)
     0.00000000E+00    2     1000025          24   # BR(~chi_2+ -> ~chi_30  W+)
     0.00000000E+00    2     1000035          24   # BR(~chi_2+ -> ~chi_40  W+)
```

```
     1.79265473E-01    2     1000024          25   # BR(~chi_2+ -> ~chi_1+  h )
     0.00000000E+00    2     1000024          35   # BR(~chi_2+ -> ~chi_1+  H )
     0.00000000E+00    2     1000024          36   # BR(~chi_2+ -> ~chi_1+  A )
     0.00000000E+00    2     1000022          37   # BR(~chi_2+ -> ~chi_10  H+)
     0.00000000E+00    2     1000023          37   # BR(~chi_2+ -> ~chi_20  H+)
     0.00000000E+00    2     1000025          37   # BR(~chi_2+ -> ~chi_30  H+)
     0.00000000E+00    2     1000035          37   # BR(~chi_2+ -> ~chi_40  H+)
#
#         PDG            Width
DECAY   1000022     0.00000000E+00   # neutralino1 decays
#
#         PDG            Width
DECAY   1000023     1.90307299E-02   # neutralino2 decays
#          BR         NDA      ID1       ID2
     0.00000000E+00    2     1000022          23   # BR(~chi_20 -> ~chi_10   Z )
     0.00000000E+00    2     1000024         -24   # BR(~chi_20 -> ~chi_1+   W-)
     0.00000000E+00    2    -1000024          24   # BR(~chi_20 -> ~chi_1-   W+)
     0.00000000E+00    2     1000037         -24   # BR(~chi_20 -> ~chi_2+   W-)
     0.00000000E+00    2    -1000037          24   # BR(~chi_20 -> ~chi_2-   W+)
     0.00000000E+00    2     1000022          25   # BR(~chi_20 -> ~chi_10   h )
     0.00000000E+00    2     1000022          35   # BR(~chi_20 -> ~chi_10   H )
     0.00000000E+00    2     1000022          36   # BR(~chi_20 -> ~chi_10   A )
     0.00000000E+00    2     1000024         -37   # BR(~chi_20 -> ~chi_1+   H-)
     0.00000000E+00    2    -1000024          37   # BR(~chi_20 -> ~chi_1-   H+)
     0.00000000E+00    2     1000037         -37   # BR(~chi_20 -> ~chi_2+   H-)
     0.00000000E+00    2    -1000037          37   # BR(~chi_20 -> ~chi_2-   H+)
     0.00000000E+00    2     1000002          -2   # BR(~chi_20 -> ~u_L      ub)
     0.00000000E+00    2    -1000002           2   # BR(~chi_20 -> ~u_L*     u )
     0.00000000E+00    2     2000002          -2   # BR(~chi_20 -> ~u_R      ub)
     0.00000000E+00    2    -2000002           2   # BR(~chi_20 -> ~u_R*     u )
     0.00000000E+00    2     1000001          -1   # BR(~chi_20 -> ~d_L      db)
     0.00000000E+00    2    -1000001           1   # BR(~chi_20 -> ~d_L*     d )
     0.00000000E+00    2     2000001          -1   # BR(~chi_20 -> ~d_R      db)
     0.00000000E+00    2    -2000001           1   # BR(~chi_20 -> ~d_R*     d )
     0.00000000E+00    2     1000004          -4   # BR(~chi_20 -> ~c_L      cb)
     0.00000000E+00    2    -1000004           4   # BR(~chi_20 -> ~c_L*     c )
     0.00000000E+00    2     2000004          -4   # BR(~chi_20 -> ~c_R      cb)
     0.00000000E+00    2    -2000004           4   # BR(~chi_20 -> ~c_R*     c )
     0.00000000E+00    2     1000003          -3   # BR(~chi_20 -> ~s_L      sb)
     0.00000000E+00    2    -1000003           3   # BR(~chi_20 -> ~s_L*     s )
```

```
     0.00000000E+00    2     2000003        -3   # BR(~chi_20 -> ~s_R      sb)
     0.00000000E+00    2    -2000003         3   # BR(~chi_20 -> ~s_R*     s )
     0.00000000E+00    2     1000006        -6   # BR(~chi_20 -> ~t_1      tb)
     0.00000000E+00    2    -1000006         6   # BR(~chi_20 -> ~t_1*     t )
     0.00000000E+00    2     2000006        -6   # BR(~chi_20 -> ~t_2      tb)
     0.00000000E+00    2    -2000006         6   # BR(~chi_20 -> ~t_2*     t )
     0.00000000E+00    2     1000005        -5   # BR(~chi_20 -> ~b_1      bb)
     0.00000000E+00    2    -1000005         5   # BR(~chi_20 -> ~b_1*     b )
     0.00000000E+00    2     2000005        -5   # BR(~chi_20 -> ~b_2      bb)
     0.00000000E+00    2    -2000005         5   # BR(~chi_20 -> ~b_2*     b )
     0.00000000E+00    2     1000011       -11   # BR(~chi_20 -> ~e_L-     e+)
     0.00000000E+00    2    -1000011        11   # BR(~chi_20 -> ~e_L+     e-)
     3.56003439E-02    2     2000011       -11   # BR(~chi_20 -> ~e_R-     e+)
     3.56003439E-02    2    -2000011        11   # BR(~chi_20 -> ~e_R+     e-)
     0.00000000E+00    2     1000013       -13   # BR(~chi_20 -> ~mu_L-    mu+)
     0.00000000E+00    2    -1000013        13   # BR(~chi_20 -> ~mu_L+    mu-)
     3.56003439E-02    2     2000013       -13   # BR(~chi_20 -> ~mu_R-    mu+)
     3.56003439E-02    2    -2000013        13   # BR(~chi_20 -> ~mu_R+    mu-)
     4.28799312E-01    2     1000015       -15   # BR(~chi_20 -> ~tau_1-   tau+)
     4.28799312E-01    2    -1000015        15   # BR(~chi_20 -> ~tau_1+   tau-)
     0.00000000E+00    2     2000015       -15   # BR(~chi_20 -> ~tau_2-   tau+)
     0.00000000E+00    2    -2000015        15   # BR(~chi_20 -> ~tau_2+   tau-)
     0.00000000E+00    2     1000012       -12   # BR(~chi_20 -> ~nu_eL    nu_eb)
     0.00000000E+00    2    -1000012        12   # BR(~chi_20 -> ~nu_eL*   nu_e )
     0.00000000E+00    2     1000014       -14   # BR(~chi_20 -> ~nu_muL   nu_mub)
     0.00000000E+00    2    -1000014        14   # BR(~chi_20 -> ~nu_muL*  nu_mu )
     0.00000000E+00    2     1000016       -16   # BR(~chi_20 -> ~nu_tau1  nu_taub
     0.00000000E+00    2    -1000016        16   # BR(~chi_20 -> ~nu_tau1* nu_tau
#
#         PDG            Width
DECAY   1000025     2.00589801E+00   # neutralino3 decays
#          BR         NDA      ID1       ID2
     1.12832058E-01    2     1000022        23   # BR(~chi_30 -> ~chi_10   Z )
     2.13279248E-01    2     1000023        23   # BR(~chi_30 -> ~chi_20   Z )
     2.96404324E-01    2     1000024       -24   # BR(~chi_30 -> ~chi_1+   W-)
     2.96404324E-01    2    -1000024        24   # BR(~chi_30 -> ~chi_1-   W+)
     0.00000000E+00    2     1000037       -24   # BR(~chi_30 -> ~chi_2+   W-)
     0.00000000E+00    2    -1000037        24   # BR(~chi_30 -> ~chi_2-   W+)
     2.09790899E-02    2     1000022        25   # BR(~chi_30 -> ~chi_10   h )
     0.00000000E+00    2     1000022        35   # BR(~chi_30 -> ~chi_10   H )
```

```
     0.00000000E+00    2     1000022        36   # BR(~chi_30 -> ~chi_10   A )
     1.20750808E-02    2     1000023        25   # BR(~chi_30 -> ~chi_20   h )
     0.00000000E+00    2     1000023        35   # BR(~chi_30 -> ~chi_20   H )
     0.00000000E+00    2     1000023        36   # BR(~chi_30 -> ~chi_20   A )
     0.00000000E+00    2     1000024       -37   # BR(~chi_30 -> ~chi_1+   H-)
     0.00000000E+00    2    -1000024        37   # BR(~chi_30 -> ~chi_1-   H+)
     0.00000000E+00    2     1000037       -37   # BR(~chi_30 -> ~chi_2+   H-)
     0.00000000E+00    2    -1000037        37   # BR(~chi_30 -> ~chi_2-   H+)
     0.00000000E+00    2     1000002        -2   # BR(~chi_30 -> ~u_L      ub)
     0.00000000E+00    2    -1000002         2   # BR(~chi_30 -> ~u_L*     u )
     0.00000000E+00    2     2000002        -2   # BR(~chi_30 -> ~u_R      ub)
     0.00000000E+00    2    -2000002         2   # BR(~chi_30 -> ~u_R*     u )
     0.00000000E+00    2     1000001        -1   # BR(~chi_30 -> ~d_L      db)
     0.00000000E+00    2    -1000001         1   # BR(~chi_30 -> ~d_L*     d )
     0.00000000E+00    2     2000001        -1   # BR(~chi_30 -> ~d_R      db)
     0.00000000E+00    2    -2000001         1   # BR(~chi_30 -> ~d_R*     d )
     0.00000000E+00    2     1000004        -4   # BR(~chi_30 -> ~c_L      cb)
     0.00000000E+00    2    -1000004         4   # BR(~chi_30 -> ~c_L*     c )
     0.00000000E+00    2     2000004        -4   # BR(~chi_30 -> ~c_R      cb)
     0.00000000E+00    2    -2000004         4   # BR(~chi_30 -> ~c_R*     c )
     0.00000000E+00    2     1000003        -3   # BR(~chi_30 -> ~s_L      sb)
     0.00000000E+00    2    -1000003         3   # BR(~chi_30 -> ~s_L*     s )
     0.00000000E+00    2     2000003        -3   # BR(~chi_30 -> ~s_R      sb)
     0.00000000E+00    2    -2000003         3   # BR(~chi_30 -> ~s_R*     s )
     0.00000000E+00    2     1000006        -6   # BR(~chi_30 -> ~t_1      tb)
     0.00000000E+00    2    -1000006         6   # BR(~chi_30 -> ~t_1*     t )
     0.00000000E+00    2     2000006        -6   # BR(~chi_30 -> ~t_2      tb)
     0.00000000E+00    2    -2000006         6   # BR(~chi_30 -> ~t_2*     t )
     0.00000000E+00    2     1000005        -5   # BR(~chi_30 -> ~b_1      bb)
     0.00000000E+00    2    -1000005         5   # BR(~chi_30 -> ~b_1*     b )
     0.00000000E+00    2     2000005        -5   # BR(~chi_30 -> ~b_2      bb)
     0.00000000E+00    2    -2000005         5   # BR(~chi_30 -> ~b_2*     b )
     5.52921324E-04    2     1000011       -11   # BR(~chi_30 -> ~e_L-     e+)
     5.52921324E-04    2    -1000011        11   # BR(~chi_30 -> ~e_L+     e-)
     1.23017609E-03    2     2000011       -11   # BR(~chi_30 -> ~e_R-     e+)
     1.23017609E-03    2    -2000011        11   # BR(~chi_30 -> ~e_R+     e-)
     5.52921324E-04    2     1000013       -13   # BR(~chi_30 -> ~mu_L-    mu+)
     5.52921324E-04    2    -1000013        13   # BR(~chi_30 -> ~mu_L+    mu-)
     1.23017609E-03    2     2000013       -13   # BR(~chi_30 -> ~mu_R-    mu+)
     1.23017609E-03    2    -2000013        13   # BR(~chi_30 -> ~mu_R+    mu-)
```

```
     5.11315426E-03    2     1000015       -15   # BR(~chi_30 -> ~tau_1-   tau+)
     5.11315426E-03    2    -1000015        15   # BR(~chi_30 -> ~tau_1+   tau-)
     6.14497627E-03    2     2000015       -15   # BR(~chi_30 -> ~tau_2-   tau+)
     6.14497627E-03    2    -2000015        15   # BR(~chi_30 -> ~tau_2+   tau-)
     3.05564820E-03    2     1000012       -12   # BR(~chi_30 -> ~nu_eL    nu_eb)
     3.05564820E-03    2    -1000012        12   # BR(~chi_30 -> ~nu_eL*   nu_e )
     3.05564820E-03    2     1000014       -14   # BR(~chi_30 -> ~nu_muL   nu_mub)
     3.05564820E-03    2    -1000014        14   # BR(~chi_30 -> ~nu_muL*  nu_mu )
     3.07731633E-03    2     1000016       -16   # BR(~chi_30 -> ~nu_tau1  nu_taub
     3.07731633E-03    2    -1000016        16   # BR(~chi_30 -> ~nu_tau1* nu_tau
#
#         PDG            Width
DECAY   1000035     2.64075669E+00   # neutralino4 decays
#          BR         NDA      ID1       ID2
     2.14197497E-02    2     1000022        23   # BR(~chi_40 -> ~chi_10   Z )
     1.92762788E-02    2     1000023        23   # BR(~chi_40 -> ~chi_20   Z )
     0.00000000E+00    2     1000025        23   # BR(~chi_40 -> ~chi_30   Z )
     2.56038819E-01    2     1000024       -24   # BR(~chi_40 -> ~chi_1+   W-)
     2.56038819E-01    2    -1000024        24   # BR(~chi_40 -> ~chi_1-   W+)
     0.00000000E+00    2     1000037       -24   # BR(~chi_40 -> ~chi_2+   W-)
     0.00000000E+00    2    -1000037        24   # BR(~chi_40 -> ~chi_2-   W+)
     6.92321545E-02    2     1000022        25   # BR(~chi_40 -> ~chi_10   h )
     0.00000000E+00    2     1000022        35   # BR(~chi_40 -> ~chi_10   H )
     0.00000000E+00    2     1000022        36   # BR(~chi_40 -> ~chi_10   A )
     1.40477554E-01    2     1000023        25   # BR(~chi_40 -> ~chi_20   h )
     0.00000000E+00    2     1000023        35   # BR(~chi_40 -> ~chi_20   H )
     0.00000000E+00    2     1000023        36   # BR(~chi_40 -> ~chi_20   A )
     0.00000000E+00    2     1000025        25   # BR(~chi_40 -> ~chi_30   h )
     0.00000000E+00    2     1000025        35   # BR(~chi_40 -> ~chi_30   H )
     0.00000000E+00    2     1000025        36   # BR(~chi_40 -> ~chi_30   A )
     0.00000000E+00    2     1000024       -37   # BR(~chi_40 -> ~chi_1+   H-)
     0.00000000E+00    2    -1000024        37   # BR(~chi_40 -> ~chi_1-   H+)
     0.00000000E+00    2     1000037       -37   # BR(~chi_40 -> ~chi_2+   H-)
     0.00000000E+00    2    -1000037        37   # BR(~chi_40 -> ~chi_2-   H+)
     0.00000000E+00    2     1000002        -2   # BR(~chi_40 -> ~u_L      ub)
     0.00000000E+00    2    -1000002         2   # BR(~chi_40 -> ~u_L*     u )
     0.00000000E+00    2     2000002        -2   # BR(~chi_40 -> ~u_R      ub)
     0.00000000E+00    2    -2000002         2   # BR(~chi_40 -> ~u_R*     u )
     0.00000000E+00    2     1000001        -1   # BR(~chi_40 -> ~d_L      db)
     0.00000000E+00    2    -1000001         1   # BR(~chi_40 -> ~d_L*     d )
```

```
0.00000000E+00    2     2000001          -1    # BR(~chi_40 -> ~d_R      db)
0.00000000E+00    2    -2000001           1    # BR(~chi_40 -> ~d_R*     d )
0.00000000E+00    2     1000004          -4    # BR(~chi_40 -> ~c_L      cb)
0.00000000E+00    2    -1000004           4    # BR(~chi_40 -> ~c_L*     c )
0.00000000E+00    2     2000004          -4    # BR(~chi_40 -> ~c_R      cb)
0.00000000E+00    2    -2000004           4    # BR(~chi_40 -> ~c_R*     c )
0.00000000E+00    2     1000003          -3    # BR(~chi_40 -> ~s_L      sb)
0.00000000E+00    2    -1000003           3    # BR(~chi_40 -> ~s_L*     s )
0.00000000E+00    2     2000003          -3    # BR(~chi_40 -> ~s_R      sb)
0.00000000E+00    2    -2000003           3    # BR(~chi_40 -> ~s_R*     s )
0.00000000E+00    2     1000006          -6    # BR(~chi_40 -> ~t_1      tb)
0.00000000E+00    2    -1000006           6    # BR(~chi_40 -> ~t_1*     t )
0.00000000E+00    2     2000006          -6    # BR(~chi_40 -> ~t_2      tb)
0.00000000E+00    2    -2000006           6    # BR(~chi_40 -> ~t_2*     t )
0.00000000E+00    2     1000005          -5    # BR(~chi_40 -> ~b_1      bb)
0.00000000E+00    2    -1000005           5    # BR(~chi_40 -> ~b_1*     b )
0.00000000E+00    2     2000005          -5    # BR(~chi_40 -> ~b_2      bb)
0.00000000E+00    2    -2000005           5    # BR(~chi_40 -> ~b_2*     b )
9.39315134E-03    2     1000011         -11    # BR(~chi_40 -> ~e_L-     e+)
9.39315134E-03    2    -1000011          11    # BR(~chi_40 -> ~e_L+     e-)
3.81930993E-03    2     2000011         -11    # BR(~chi_40 -> ~e_R-     e+)
3.81930993E-03    2    -2000011          11    # BR(~chi_40 -> ~e_R+     e-)
9.39315134E-03    2     1000013         -13    # BR(~chi_40 -> ~mu_L-    mu+)
9.39315134E-03    2    -1000013          13    # BR(~chi_40 -> ~mu_L+    mu-)
3.81930993E-03    2     2000013         -13    # BR(~chi_40 -> ~mu_R-    mu+)
3.81930993E-03    2    -2000013          13    # BR(~chi_40 -> ~mu_R+    mu-)
2.95801537E-03    2     1000015         -15    # BR(~chi_40 -> ~tau_1-   tau+)
2.95801537E-03    2    -1000015          15    # BR(~chi_40 -> ~tau_1+   tau-)
1.54402189E-02    2     2000015         -15    # BR(~chi_40 -> ~tau_2-   tau+)
1.54402189E-02    2    -2000015          15    # BR(~chi_40 -> ~tau_2+   tau-)
2.45937844E-02    2     1000012         -12    # BR(~chi_40 -> ~nu_eL    nu_eb)
2.45937844E-02    2    -1000012          12    # BR(~chi_40 -> ~nu_eL*   nu_e )
2.45937844E-02    2     1000014         -14    # BR(~chi_40 -> ~nu_muL   nu_mub)
2.45937844E-02    2    -1000014          14    # BR(~chi_40 -> ~nu_muL*  nu_mu )
2.47475867E-02    2     1000016         -16    # BR(~chi_40 -> ~nu_tau1  nu_taub
2.47475867E-02    2    -1000016          16    # BR(~chi_40 -> ~nu_tau1* nu_tau
```

Output file in a simple transparent form

```
                    ======================
                    | THE SDECAY OUTPUT |
                    ======================


         -----------------------------------------------------
         |  SUSY Les Houches Accord - MSSM Spectrum + Decays |
         |                                                   |
         |                     SDECAY 1.0                    |
         |                                                   |
         |  Authors: M.Muhlleitner, A.Djouadi and Y.Mambrini |
         |  Ref.:    hep-ph/0311167                          |
         |                                                   |
         |  In case of problems please send an email to      |
         |           margarete.muehlleitner@psich            |
         |           djouadi@lpm.univ-montp2.fr              |
         |           mambrini@delta.ft.uam.es                |
         |                                                   |
         |  If not stated otherwise all DRbar couplings and  |
         |  soft SUSY breaking masses are given at the scale |
         |  Q=  0.48391963E+03                               |
         |                                                   |
         -----------------------------------------------------


Notation:
---------
bosons: gm = gamma, gl = gluon, G = Gravitino

fermions: up   = up,         ub   = up_bar,     dn = down,    db = down_bar,
          ch   = charm,      cb   = charm_bar,  st = strange, sb = strange_bar,
          bt   = bottom,     bb   = bottom_bar, tp = top,     tb = top_bar,
          e+   = positron,   e-   = electron,   mu+= muon_+,  mu-= muon_-
          tau+ = tau_+,      tau- = tau_-
          nue  = neutrino_electron, num = neutrino_muon,
          nueb = neutrino_el_bar,   numb = neutrino_muon_bar,
          nut  = neutrino_tau,      nutb = neutrino_tau_bar

sfermions: supl/r   = sup_L/R,       subl/r   = sup_L/R_bar,
           sdnl/r   = sdown_L/R_bar, sdbl/r   = sdown_L/R_bar,
```

```
          schl/r   = scharm_L/R,    scbl/r   = scharm_L/R_bar,
          sstl/r   = sstrange_L/R,  ssbl/r   = sstrange_L/R_bar,
          stop1/2  = stop_1/2,      stop1/2b = stop_1/2_bar,
          sbot1/2  = sbottom_1/2,   sbot1/2b = sbottom_1/2_bar,
          sel+/-   = selectronL+/-, ser+/-   = selectronR+/-,
          smul+/-  = smuonL+/-,     smur+/-  = smuonR+/-,
          stau1+/- = stau_1+/-,     stau2+/- = stau_2+/-,
          snuel = sneutrino_el_L,   snuml  = sneutrino_muon_L,
          snut1 = sneutrino_tau_1,  snuelb = sneutrino_el_L_bar
          snumlb= sneutrino_mu_L_bar, snut1b = sneutrino_tau_1_bar

gauginos: chi0_1/2/3/4 = neutralino1/2/3/4, chi+_1/2 = chargino_1/2_+


Higgs and SUSY particle mass spectrum
-------------------------------------
   h           H            A           H+
110.808888  399.807034  399.429738  407.727445

  chi+_1      chi+_2
179.732831  382.280312

  chi0_1      chi0_2      chi0_3      chi0_4
97.1655613  180.732549 -364.666587  381.926176

  gluino
604.021988

  supl         supr       sdnl        sdnr
565.241313  547.569179  570.647213  547.300689

  schl         schr       sstl        sstr
565.241313  547.569179  570.647213  547.300689

  stop1        stop2      sbot1       sbot2
399.453895  586.280284  515.125148  547.105875

  sel          ser        smul        smur
207.124328  143.937924  207.124328  143.937924
```

```
  stau1        stau2
134.843434  210.680492

  snuel        snuml      snut1
191.279304  191.279304  190.385406


Mass matrices and mixing angles
-------------------------------
hmix Q=  483.919634

 tan(beta)   alpha(h,H)
10. -0.113954677

 theta_t      theta_b    theta_tau
0.98434993  0.327127997  1.30336556

N(i,j) Neutralino mixing matrix
i=1       -0.985759E+00       0.561432E-01      -0.148854E+00       0.544924E-01
i=2       -0.103915E+00      -0.942754E+00       0.274827E+00      -0.157757E+00
i=3        0.604836E-01      -0.902611E-01      -0.694837E+00      -0.710912E+00
i=4        0.117569E+00      -0.316096E+00      -0.647699E+00       0.683189E+00

U(i,j) Chargino mixing matrix U
i=1       -0.917934E+00       0.396733E+00
i=2        0.396733E+00       0.917934E+00

V(i,j) Chargino mixing matrix V
i=1       -0.971218E+00       0.238192E+00
i=2        0.238192E+00       0.971218E+00


Higgsino mixing parameter
-------------------------
hmix Q   =  483.919634
mu DRbar =  357.352995


The gauge couplings
-------------------
```

```
 g,gprime Q   =  483.919634
 gprime DRbar =  0.361193779
 g DRbar      =  0.646479958

 alpha_s DRbar Q =  483.919634
 alpha_s DRbar   =  0.0954033724


 The trilinear couplings AU, AD, AE
 ----------------------------------
 Q =  483.919634
 3,3 A_t DRbar   = -496.575993
 3,3 A_b DRbar   = -790.589211
 3,3 A_tau DRbar = -251.53292


 The Yukawa couplings
 --------------------
 y_tau DRbar Q =  483.919634
 y_t,b DRbar Q =  483.919634

 y_tau DRbar =  0.10032246
 y_t DRbar   =  1.37994611
 y_b DRbar   =  0.212469479


===================
| The decay table |
===================

 The multi-body decays for the inos and sfermions are included.

 The loop induced decays for the gluino, neutralinos and stops
 are included.

 The SUSY decays of the top quark are included.



 Decaying particle + total width
```

```
Parent --> Daughters        Width      Branching Ratio

TOP DECAYS   1.50457964
----------
top --> bottom W+      0.150457964E+01  0.100000000E+01
top --> bottom H+      0.000000000E+00  0.000000000E+00
top --> stop1  chi0_1  0.000000000E+00  0.000000000E+00
top --> stop1  chi0_2  0.000000000E+00  0.000000000E+00
top --> stop1  chi0_3  0.000000000E+00  0.000000000E+00
top --> stop1  chi0_4  0.000000000E+00  0.000000000E+00
top --> stop2  chi0_1  0.000000000E+00  0.000000000E+00
top --> stop2  chi0_2  0.000000000E+00  0.000000000E+00
top --> stop2  chi0_3  0.000000000E+00  0.000000000E+00
top --> stop2  chi0_4  0.000000000E+00  0.000000000E+00

GLUINO DECAYS   4.61131613
-------------
gluino --> supl   ub  0.111268148E+00  0.241293689E-01
gluino --> subl   up  0.111268148E+00  0.241293689E-01
gluino --> supr   ub  0.228709002E+00  0.495973373E-01
gluino --> subr   up  0.228709002E+00  0.495973373E-01
gluino --> sdnl   db  0.831731887E-01  0.180367570E-01
gluino --> sdbl   dn  0.831731887E-01  0.180367570E-01
gluino --> sdnr   db  0.230782009E+00  0.500468851E-01
gluino --> sdbr   dn  0.230782009E+00  0.500468851E-01
gluino --> schl   cb  0.111268148E+00  0.241293689E-01
gluino --> scbl   ch  0.111268148E+00  0.241293689E-01
gluino --> schr   cb  0.228709002E+00  0.495973373E-01
gluino --> scbr   ch  0.228709002E+00  0.495973373E-01
gluino --> sstl   sb  0.831731887E-01  0.180367570E-01
gluino --> ssbl   st  0.831731887E-01  0.180367570E-01
gluino --> sstr   sb  0.230782009E+00  0.500468851E-01
gluino --> ssbr   st  0.230782009E+00  0.500468851E-01
gluino --> stop1  tb  0.237932202E+00  0.515974605E-01
gluino --> stop1b tp  0.237932202E+00  0.515974605E-01
gluino --> stop2  tb  0.000000000E+00  0.000000000E+00
gluino --> stop2b tp  0.000000000E+00  0.000000000E+00
gluino --> sbot1  bb  0.515685994E+00  0.111830545E+00
gluino --> sbot1b bt  0.515685994E+00  0.111830545E+00
gluino --> sbot2  bb  0.244175176E+00  0.529512983E-01
```

```
gluino --> sbot2b bt  0.244175176E+00  0.529512983E-01

STOP1 DECAYS   2.05166768
------------
stop1 --> chi0_1 tp  0.397401007E+00  0.193696577E+00
stop1 --> chi0_2 tp  0.241413639E+00  0.117667028E+00
stop1 --> chi0_3 tp  0.000000000E+00  0.000000000E+00
stop1 --> chi0_4 tp  0.000000000E+00  0.000000000E+00
stop1 --> chi+_1 bt  0.139210890E+01  0.678525532E+00
stop1 --> chi+_2 bt  0.207441304E-01  0.101108628E-01
stop1 --> gluino tp  0.000000000E+00  0.000000000E+00
stop1 --> sbot1  H+  0.000000000E+00  0.000000000E+00
stop1 --> sbot2  H+  0.000000000E+00  0.000000000E+00
stop1 --> sbot1  W+  0.000000000E+00  0.000000000E+00
stop1 --> sbot2  W+  0.000000000E+00  0.000000000E+00

STOP2 DECAYS   7.36821884
------------
stop2 --> chi0_1 tp  0.220657358E+00  0.299471775E-01
stop2 --> chi0_2 tp  0.638125569E+00  0.866051324E-01
stop2 --> chi0_3 tp  0.310536094E+00  0.421453407E-01
stop2 --> chi0_4 tp  0.144635778E+01  0.196296800E+00
stop2 --> chi+_1 bt  0.159076782E+01  0.215895843E+00
stop2 --> chi+_2 bt  0.147470706E+01  0.200144308E+00
stop2 --> gluino tp  0.000000000E+00  0.000000000E+00
stop2 --> stop1  h   0.269334978E+00  0.365536073E-01
stop2 --> stop1  H   0.000000000E+00  0.000000000E+00
stop2 --> stop1  A   0.000000000E+00  0.000000000E+00
stop2 --> sbot1  H+  0.000000000E+00  0.000000000E+00
stop2 --> sbot2  H+  0.000000000E+00  0.000000000E+00
stop2 --> stop1  Z   0.141773218E+01  0.192411790E+00
stop2 --> sbot1  W+  0.000000000E+00  0.000000000E+00
stop2 --> sbot2  W+  0.000000000E+00  0.000000000E+00

SBOTTOM1 DECAYS   3.8623272
---------------
sbot1 --> chi0_1 bt  0.166662081E+00  0.431506893E-01
sbot1 --> chi0_2 bt  0.134206269E+01  0.347475142E+00
sbot1 --> chi0_3 bt  0.196116223E-01  0.507766983E-02
sbot1 --> chi0_4 bt  0.425295167E-01  0.110113707E-01
```

```
sbot1 --> chi-_1 tp  0.172934950E+01  0.447748056E+00
sbot1 --> chi-_2 tp  0.000000000E+00  0.000000000E+00
sbot1 --> gluino bt  0.000000000E+00  0.000000000E+00
sbot1 --> stop1  H-  0.000000000E+00  0.000000000E+00
sbot1 --> stop2  H-  0.000000000E+00  0.000000000E+00
sbot1 --> stop1  W-  0.562111792E+00  0.145537072E+00
sbot1 --> stop2  W-  0.000000000E+00  0.000000000E+00

SBOTTOM2 DECAYS   0.755887804
---------------
sbot2 --> chi0_1 bt  0.239702138E+00  0.317113382E+00
sbot2 --> chi0_2 bt  0.930504724E-01  0.123100905E+00
sbot2 --> chi0_3 bt  0.421253732E-01  0.557296638E-01
sbot2 --> chi0_4 bt  0.586030540E-01  0.775287730E-01
sbot2 --> chi-_1 tp  0.124486152E+00  0.164688663E+00
sbot2 --> chi-_2 tp  0.000000000E+00  0.000000000E+00
sbot2 --> gluino bt  0.000000000E+00  0.000000000E+00
sbot2 --> sbot1  h   0.000000000E+00  0.000000000E+00
sbot2 --> sbot1  H   0.000000000E+00  0.000000000E+00
sbot2 --> sbot1  A   0.000000000E+00  0.000000000E+00
sbot2 --> stop1  H-  0.000000000E+00  0.000000000E+00
sbot2 --> stop2  H-  0.000000000E+00  0.000000000E+00
sbot2 --> stop1  W-  0.197920614E+00  0.261838613E+00
sbot2 --> stop2  W-  0.000000000E+00  0.000000000E+00
sbot2 --> sbot1  Z0  0.000000000E+00  0.000000000E+00

SUPL DECAYS   5.51461615
-----------
supl --> chi0_1 up  0.359424225E-01  0.651766534E-02
supl --> chi0_2 up  0.175313102E+01  0.317906264E+00
supl --> chi0_3 up  0.499759199E-02  0.906244759E-03
supl --> chi0_4 up  0.600682403E-01  0.108925515E-01
supl --> chi+_1 dn  0.358197345E+01  0.649541754E+00
supl --> chi+_2 dn  0.785034258E-01  0.142355195E-01
supl --> gluino up  0.000000000E+00  0.000000000E+00

SUPR DECAYS   1.16832579
-----------
supr --> chi0_1 up  0.115145952E+01  0.985563724E+00
supr --> chi0_2 up  0.108308608E-01  0.927041142E-02
```

```
supr --> chi0_3 up  0.143110194E-02  0.122491684E-02
supr --> chi0_4 up  0.460431057E-02  0.394094746E-02
supr --> chi+_1 dn  0.000000000E+00  0.000000000E+00
supr --> chi+_2 dn  0.000000000E+00  0.000000000E+00
supr --> gluino up  0.000000000E+00  0.000000000E+00

SDOWNL DECAYS   5.32801931
-------------
sdnl --> chi0_1 dn  0.128545663E+00  0.241263508E-01
sdnl --> chi0_2 dn  0.163736654E+01  0.307312425E+00
sdnl --> chi0_3 dn  0.855901181E-02  0.160641531E-02
sdnl --> chi0_4 dn  0.825953801E-01  0.155020797E-01
sdnl --> chi-_1 up  0.324403769E+01  0.608863727E+00
sdnl --> chi-_2 up  0.226915027E+00  0.425890023E-01
sdnl --> gluino dn  0.000000000E+00  0.000000000E+00

SDOWNR DECAYS   0.291916525
-------------
sdnr --> chi0_1 dn  0.287705371E+00  0.985574117E+00
sdnr --> chi0_2 dn  0.270573811E-02  0.926887613E-02
sdnr --> chi0_3 dn  0.357040865E-03  0.122309234E-02
sdnr --> chi0_4 dn  0.114837480E-02  0.393391500E-02
sdnr --> chi-_1 up  0.000000000E+00  0.000000000E+00
sdnr --> chi-_2 up  0.000000000E+00  0.000000000E+00
sdnr --> gluino dn  0.000000000E+00  0.000000000E+00

SCHARML DECAYS   5.51461615
--------------
schl --> chi0_1 ch  0.359424225E-01  0.651766534E-02
schl --> chi0_2 ch  0.175313102E+01  0.317906264E+00
schl --> chi0_3 ch  0.499759199E-02  0.906244759E-03
schl --> chi0_4 ch  0.600682403E-01  0.108925515E-01
schl --> chi+_1 st  0.358197345E+01  0.649541754E+00
schl --> chi+_2 st  0.785034258E-01  0.142355195E-01
schl --> gluino ch  0.000000000E+00  0.000000000E+00

SCHARMR DECAYS   1.16832579
--------------
schr --> chi0_1 ch  0.115145952E+01  0.985563724E+00
schr --> chi0_2 ch  0.108308608E-01  0.927041142E-02
```

```
schr --> chi0_3 ch  0.143110194E-02  0.122491684E-02
schr --> chi0_4 ch  0.460431057E-02  0.394094746E-02
schr --> chi+_1 st  0.000000000E+00  0.000000000E+00
schr --> chi+_2 st  0.000000000E+00  0.000000000E+00
schr --> gluino ch  0.000000000E+00  0.000000000E+00

STRANGEL DECAYS   5.32801931
---------------
sstl --> chi0_1 st  0.128545663E+00  0.241263508E-01
sstl --> chi0_2 st  0.163736654E+01  0.307312425E+00
sstl --> chi0_3 st  0.855901181E-02  0.160641531E-02
sstl --> chi0_4 st  0.825953801E-01  0.155020797E-01
sstl --> chi-_1 ch  0.324403769E+01  0.608863727E+00
sstl --> chi-_2 ch  0.226915027E+00  0.425890023E-01
sstl --> gluino st  0.000000000E+00  0.000000000E+00

STRANGER DECAYS   0.291916525
---------------
sstr --> chi0_1 st  0.287705371E+00  0.985574117E+00
sstr --> chi0_2 st  0.270573811E-02  0.926887613E-02
sstr --> chi0_3 st  0.357040865E-03  0.122309234E-02
sstr --> chi0_4 st  0.114837480E-02  0.393391500E-02
sstr --> chi-_1 ch  0.000000000E+00  0.000000000E+00
sstr --> chi-_2 ch  0.000000000E+00  0.000000000E+00
sstr --> gluino st  0.000000000E+00  0.000000000E+00

SELECTRONL DECAYS   0.265771989
-----------------
sel- --> chi0_1 e-   0.128137202E+00  0.482132079E+00
sel- --> chi0_2 e-   0.491023093E-01  0.184753516E+00
sel- --> chi0_3 e-   0.000000000E+00  0.000000000E+00
sel- --> chi0_4 e-   0.000000000E+00  0.000000000E+00
sel- --> chi-_1 nue  0.885324779E-01  0.333114405E+00
sel- --> chi-_2 nue  0.000000000E+00  0.000000000E+00

SELECTRONR DECAYS   0.215100879
-----------------
ser- --> chi0_1 e-   0.215100879E+00  0.100000000E+01
ser- --> chi0_2 e-   0.000000000E+00  0.000000000E+00
ser- --> chi0_3 e-   0.000000000E+00  0.000000000E+00
```

```
ser- --> chi0_4 e-   0.000000000E+00  0.000000000E+00
ser- --> chi-_1 nue  0.000000000E+00  0.000000000E+00
ser- --> chi-_2 nue  0.000000000E+00  0.000000000E+00

SMUONL DECAYS   0.265771989
-------------
smul- --> chi0_1 mu-  0.128137202E+00  0.482132079E+00
smul- --> chi0_2 mu-  0.491023093E-01  0.184753516E+00
smul- --> chi0_3 mu-  0.000000000E+00  0.000000000E+00
smul- --> chi0_4 mu-  0.000000000E+00  0.000000000E+00
smul- --> chi-_1 num  0.885324779E-01  0.333114405E+00
smul- --> chi-_2 num  0.000000000E+00  0.000000000E+00

SMUONR DECAYS   0.215100879
-------------
smur- --> chi0_1 mu-  0.215100879E+00  0.100000000E+01
smur- --> chi0_2 mu-  0.000000000E+00  0.000000000E+00
smur- --> chi0_3 mu-  0.000000000E+00  0.000000000E+00
smur- --> chi0_4 mu-  0.000000000E+00  0.000000000E+00
smur- --> chi-_1 num  0.000000000E+00  0.000000000E+00
smur- --> chi-_2 num  0.000000000E+00  0.000000000E+00

STAU1 DECAYS   0.150752468
------------
stau1 --> chi0_1 tau-  0.150752468E+00  0.100000000E+01
stau1 --> chi0_2 tau-  0.000000000E+00  0.000000000E+00
stau1 --> chi0_3 tau-  0.000000000E+00  0.000000000E+00
stau1 --> chi0_4 tau-  0.000000000E+00  0.000000000E+00
stau1 --> chi-_1 nut   0.000000000E+00  0.000000000E+00
stau1 --> chi-_2 nut   0.000000000E+00  0.000000000E+00
stau1 --> snut1  H-    0.000000000E+00  0.000000000E+00
stau1 --> snut1  W-    0.000000000E+00  0.000000000E+00

STAU2 DECAYS   0.316117512
------------
stau2 --> chi0_1 tau-  0.163236376E+00  0.516378784E+00
stau2 --> chi0_2 tau-  0.548538878E-01  0.173523724E+00
stau2 --> chi0_3 tau-  0.000000000E+00  0.000000000E+00
stau2 --> chi0_4 tau-  0.000000000E+00  0.000000000E+00
stau2 --> chi-_1 nut   0.980272479E-01  0.310097493E+00
```

```
stau2 --> chi-_2 nut   0.000000000E+00  0.000000000E+00
stau2 --> snut1  H-    0.000000000E+00  0.000000000E+00
stau2 --> snut1  W-    0.000000000E+00  0.000000000E+00
stau2 --> stau1  h     0.000000000E+00  0.000000000E+00
stau2 --> stau1  H     0.000000000E+00  0.000000000E+00
stau2 --> stau1  A     0.000000000E+00  0.000000000E+00
stau2 --> stau1  Z     0.000000000E+00  0.000000000E+00

SNEUTRINO_EL DECAYS   0.188960219
-------------------
snuel --> chi0_1 nue  0.161237224E+00  0.853286607E+00
snuel --> chi0_2 nue  0.715723581E-02  0.378769448E-01
snuel --> chi0_3 nue  0.000000000E+00  0.000000000E+00
snuel --> chi0_4 nue  0.000000000E+00  0.000000000E+00
snuel --> chi+_1 e-   0.205657592E-01  0.108836448E+00
snuel --> chi+_2 e-   0.000000000E+00  0.000000000E+00

SNEUTRINO_MUL DECAYS   0.188960219
--------------------
snuml --> chi0_1 num  0.161237224E+00  0.853286607E+00
snuml --> chi0_2 num  0.715723581E-02  0.378769448E-01
snuml --> chi0_3 num  0.000000000E+00  0.000000000E+00
snuml --> chi0_4 num  0.000000000E+00  0.000000000E+00
snuml --> chi+_1 mu-  0.205657592E-01  0.108836448E+00
snuml --> chi+_2 mu-  0.000000000E+00  0.000000000E+00

SNEUTRINO_TAU1 DECAYS   0.182603291
---------------------
snut1 --> chi0_1 nut   0.159434756E+00  0.873120935E+00
snut1 --> chi0_2 nut   0.605107755E-02  0.331378341E-01
snut1 --> chi0_3 nut   0.000000000E+00  0.000000000E+00
snut1 --> chi0_4 nut   0.000000000E+00  0.000000000E+00
snut1 --> chi+_1 tau-  0.171174573E-01  0.937412313E-01
snut1 --> chi+_2 tau-  0.000000000E+00  0.000000000E+00
snut1 --> stau1+ H-    0.000000000E+00  0.000000000E+00
snut1 --> stau2+ H-    0.000000000E+00  0.000000000E+00
snut1 --> stau1+ W-    0.000000000E+00  0.000000000E+00
snut1 --> stau2+ W-    0.000000000E+00  0.000000000E+00

CHARGINO1 DECAYS   0.0135685772
```

```
----------------
chi+_1 --> supl   db     0.000000000E+00  0.000000000E+00
chi+_1 --> supr   db     0.000000000E+00  0.000000000E+00
chi+_1 --> sdbl   up     0.000000000E+00  0.000000000E+00
chi+_1 --> sdbr   up     0.000000000E+00  0.000000000E+00
chi+_1 --> schl   sb     0.000000000E+00  0.000000000E+00
chi+_1 --> schr   sb     0.000000000E+00  0.000000000E+00
chi+_1 --> ssbl   ch     0.000000000E+00  0.000000000E+00
chi+_1 --> ssbr   ch     0.000000000E+00  0.000000000E+00
chi+_1 --> stop1  bb     0.000000000E+00  0.000000000E+00
chi+_1 --> stop2  bb     0.000000000E+00  0.000000000E+00
chi+_1 --> sbot1b tp     0.000000000E+00  0.000000000E+00
chi+_1 --> sbot2b tp     0.000000000E+00  0.000000000E+00
chi+_1 --> snuel  e+     0.000000000E+00  0.000000000E+00
chi+_1 --> snuml  mu+    0.000000000E+00  0.000000000E+00
chi+_1 --> snut1  tau+   0.000000000E+00  0.000000000E+00
chi+_1 --> sel+   nue    0.000000000E+00  0.000000000E+00
chi+_1 --> ser+   nue    0.000000000E+00  0.000000000E+00
chi+_1 --> smul+  num    0.000000000E+00  0.000000000E+00
chi+_1 --> smur+  num    0.000000000E+00  0.000000000E+00
chi+_1 --> stau1+ nut    0.130174289E-01  0.959380537E+00
chi+_1 --> stau2+ nut    0.000000000E+00  0.000000000E+00
chi+_1 --> chi0_1 W+     0.551148316E-03  0.406194628E-01
chi+_1 --> chi0_2 W+     0.000000000E+00  0.000000000E+00
chi+_1 --> chi0_3 W+     0.000000000E+00  0.000000000E+00
chi+_1 --> chi0_4 W+     0.000000000E+00  0.000000000E+00
chi+_1 --> chi0_1 H+     0.000000000E+00  0.000000000E+00
chi+_1 --> chi0_2 H+     0.000000000E+00  0.000000000E+00
chi+_1 --> chi0_3 H+     0.000000000E+00  0.000000000E+00
chi+_1 --> chi0_4 H+     0.000000000E+00  0.000000000E+00

CHARGINO2 DECAYS   2.50174306
----------------
chi+_2 --> supl   db     0.000000000E+00  0.000000000E+00
chi+_2 --> supr   db     0.000000000E+00  0.000000000E+00
chi+_2 --> sdbl   up     0.000000000E+00  0.000000000E+00
chi+_2 --> sdbr   up     0.000000000E+00  0.000000000E+00
chi+_2 --> schl   sb     0.000000000E+00  0.000000000E+00
chi+_2 --> schr   sb     0.000000000E+00  0.000000000E+00
chi+_2 --> ssbl   ch     0.000000000E+00  0.000000000E+00
```

```
chi+_2 --> ssbr   ch     0.000000000E+00  0.000000000E+00
chi+_2 --> stop1  bb     0.000000000E+00  0.000000000E+00
chi+_2 --> stop2  bb     0.000000000E+00  0.000000000E+00
chi+_2 --> sbot1b tp     0.000000000E+00  0.000000000E+00
chi+_2 --> sbot2b tp     0.000000000E+00  0.000000000E+00
chi+_2 --> snuel  e+     0.506696192E-01  0.202537263E-01
chi+_2 --> snuml  mu+    0.506696192E-01  0.202537263E-01
chi+_2 --> snut1  tau+   0.684653622E-01  0.273670639E-01
chi+_2 --> sel+   nue    0.124835670E+00  0.498994770E-01
chi+_2 --> ser+   nue    0.000000000E+00  0.000000000E+00
chi+_2 --> smul+  num    0.124835670E+00  0.498994770E-01
chi+_2 --> smur+  num    0.000000000E+00  0.000000000E+00
chi+_2 --> stau1+ nut    0.129050435E-02  0.515842083E-03
chi+_2 --> stau2+ nut    0.136085831E+00  0.543964061E-01
chi+_2 --> chi+_1 Z      0.613905919E+00  0.245391275E+00
chi+_2 --> chi0_1 W+     0.170544056E+00  0.681700926E-01
chi+_2 --> chi0_2 W+     0.711964657E+00  0.284587441E+00
chi+_2 --> chi0_3 W+     0.000000000E+00  0.000000000E+00
chi+_2 --> chi0_4 W+     0.000000000E+00  0.000000000E+00
chi+_2 --> chi+_1 h      0.448476152E+00  0.179265473E+00
chi+_2 --> chi+_1 H      0.000000000E+00  0.000000000E+00
chi+_2 --> chi+_1 A      0.000000000E+00  0.000000000E+00
chi+_2 --> chi0_1 H+     0.000000000E+00  0.000000000E+00
chi+_2 --> chi0_2 H+     0.000000000E+00  0.000000000E+00
chi+_2 --> chi0_3 H+     0.000000000E+00  0.000000000E+00
chi+_2 --> chi0_4 H+     0.000000000E+00  0.000000000E+00

NEUTRALINO1 STABLE
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NEUTRALINO2 DECAYS   0.0190307299
------------------
chi0_2 --> chi0_1 Z     0.000000000E+00  0.000000000E+00
chi0_2 --> chi+_1 W-    0.000000000E+00  0.000000000E+00
chi0_2 --> chi-_1 W+    0.000000000E+00  0.000000000E+00
chi0_2 --> chi+_2 W-    0.000000000E+00  0.000000000E+00
chi0_2 --> chi-_2 W+    0.000000000E+00  0.000000000E+00
chi0_2 --> chi0_1 h     0.000000000E+00  0.000000000E+00
chi0_2 --> chi0_1 H     0.000000000E+00  0.000000000E+00
chi0_2 --> chi0_1 A     0.000000000E+00  0.000000000E+00
```

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chi0_2 --> chi+_1 H-    0.000000000E+00  0.000000000E+00
chi0_2 --> chi-_1 H+    0.000000000E+00  0.000000000E+00
chi0_2 --> chi+_2 H-    0.000000000E+00  0.000000000E+00
chi0_2 --> chi-_2 H+    0.000000000E+00  0.000000000E+00
chi0_2 --> supl   ub    0.000000000E+00  0.000000000E+00
chi0_2 --> subl   up    0.000000000E+00  0.000000000E+00
chi0_2 --> supr   ub    0.000000000E+00  0.000000000E+00
chi0_2 --> subr   up    0.000000000E+00  0.000000000E+00
chi0_2 --> sdnl   db    0.000000000E+00  0.000000000E+00
chi0_2 --> sdbl   dn    0.000000000E+00  0.000000000E+00
chi0_2 --> sdnr   db    0.000000000E+00  0.000000000E+00
chi0_2 --> sdbr   dn    0.000000000E+00  0.000000000E+00
chi0_2 --> schl   cb    0.000000000E+00  0.000000000E+00
chi0_2 --> scbl   ch    0.000000000E+00  0.000000000E+00
chi0_2 --> schr   cb    0.000000000E+00  0.000000000E+00
chi0_2 --> scbr   ch    0.000000000E+00  0.000000000E+00
chi0_2 --> sstl   sb    0.000000000E+00  0.000000000E+00
chi0_2 --> ssbl   st    0.000000000E+00  0.000000000E+00
chi0_2 --> sstr   sb    0.000000000E+00  0.000000000E+00
chi0_2 --> ssbr   st    0.000000000E+00  0.000000000E+00
chi0_2 --> stop1  tb    0.000000000E+00  0.000000000E+00
chi0_2 --> stop1b tp    0.000000000E+00  0.000000000E+00
chi0_2 --> stop2  tb    0.000000000E+00  0.000000000E+00
chi0_2 --> stop2b tp    0.000000000E+00  0.000000000E+00
chi0_2 --> sbot1  bb    0.000000000E+00  0.000000000E+00
chi0_2 --> sbot1b bt    0.000000000E+00  0.000000000E+00
chi0_2 --> sbot2  bb    0.000000000E+00  0.000000000E+00
chi0_2 --> sbot2b bt    0.000000000E+00  0.000000000E+00
chi0_2 --> sel-   e+    0.000000000E+00  0.000000000E+00
chi0_2 --> sel+   e-    0.000000000E+00  0.000000000E+00
chi0_2 --> ser-   e+    0.677500529E-03  0.356003439E-01
chi0_2 --> ser+   e-    0.677500529E-03  0.356003439E-01
chi0_2 --> smul-  mu+   0.000000000E+00  0.000000000E+00
chi0_2 --> smul+  mu-   0.000000000E+00  0.000000000E+00
chi0_2 --> smur-  mu+   0.677500529E-03  0.356003439E-01
chi0_2 --> smur+  mu-   0.677500529E-03  0.356003439E-01
chi0_2 --> stau1- tau+  0.816036389E-02  0.428799312E+00
chi0_2 --> stau1+ tau-  0.816036389E-02  0.428799312E+00
chi0_2 --> stau2- tau+  0.000000000E+00  0.000000000E+00
chi0_2 --> stau2+ tau-  0.000000000E+00  0.000000000E+00
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chi0_2 --> snuel  nueb  0.000000000E+00  0.000000000E+00
chi0_2 --> snuelb nue   0.000000000E+00  0.000000000E+00
chi0_2 --> snuml  numb  0.000000000E+00  0.000000000E+00
chi0_2 --> snumlb num   0.000000000E+00  0.000000000E+00
chi0_2 --> snut1  nutb  0.000000000E+00  0.000000000E+00
chi0_2 --> snut1b nut   0.000000000E+00  0.000000000E+00

NEUTRALINO3 DECAYS   2.00589801
------------------
chi0_3 --> chi0_1 Z     0.226329600E+00  0.112832058E+00
chi0_3 --> chi0_2 Z     0.427816420E+00  0.213279248E+00
chi0_3 --> chi+_1 W-    0.594556843E+00  0.296404324E+00
chi0_3 --> chi-_1 W+    0.594556843E+00  0.296404324E+00
chi0_3 --> chi+_2 W-    0.000000000E+00  0.000000000E+00
chi0_3 --> chi-_2 W+    0.000000000E+00  0.000000000E+00
chi0_3 --> chi0_1 h     0.420819148E-01  0.209790899E-01
chi0_3 --> chi0_1 H     0.000000000E+00  0.000000000E+00
chi0_3 --> chi0_1 A     0.000000000E+00  0.000000000E+00
chi0_3 --> chi0_2 h     0.242213805E-01  0.120750808E-01
chi0_3 --> chi0_2 H     0.000000000E+00  0.000000000E+00
chi0_3 --> chi0_2 A     0.000000000E+00  0.000000000E+00
chi0_3 --> chi+_1 H-    0.000000000E+00  0.000000000E+00
chi0_3 --> chi-_1 H+    0.000000000E+00  0.000000000E+00
chi0_3 --> chi+_2 H-    0.000000000E+00  0.000000000E+00
chi0_3 --> chi-_2 H+    0.000000000E+00  0.000000000E+00
chi0_3 --> supl   ub    0.000000000E+00  0.000000000E+00
chi0_3 --> subl   up    0.000000000E+00  0.000000000E+00
chi0_3 --> supr   ub    0.000000000E+00  0.000000000E+00
chi0_3 --> subr   up    0.000000000E+00  0.000000000E+00
chi0_3 --> sdnl   db    0.000000000E+00  0.000000000E+00
chi0_3 --> sdbl   dn    0.000000000E+00  0.000000000E+00
chi0_3 --> sdnr   db    0.000000000E+00  0.000000000E+00
chi0_3 --> sdbr   dn    0.000000000E+00  0.000000000E+00
chi0_3 --> schl   cb    0.000000000E+00  0.000000000E+00
chi0_3 --> scbl   ch    0.000000000E+00  0.000000000E+00
chi0_3 --> schr   cb    0.000000000E+00  0.000000000E+00
chi0_3 --> scbr   ch    0.000000000E+00  0.000000000E+00
chi0_3 --> sstl   sb    0.000000000E+00  0.000000000E+00
chi0_3 --> ssbl   st    0.000000000E+00  0.000000000E+00
chi0_3 --> sstr   sb    0.000000000E+00  0.000000000E+00
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chi0_3 --> ssbr   st    0.000000000E+00  0.000000000E+00
chi0_3 --> stop1  tb    0.000000000E+00  0.000000000E+00
chi0_3 --> stop1b tp    0.000000000E+00  0.000000000E+00
chi0_3 --> stop2  tb    0.000000000E+00  0.000000000E+00
chi0_3 --> stop2b tp    0.000000000E+00  0.000000000E+00
chi0_3 --> sbot1  bb    0.000000000E+00  0.000000000E+00
chi0_3 --> sbot1b bt    0.000000000E+00  0.000000000E+00
chi0_3 --> sbot2  bb    0.000000000E+00  0.000000000E+00
chi0_3 --> sbot2b bt    0.000000000E+00  0.000000000E+00
chi0_3 --> sel-   e+    0.110910378E-02  0.552921324E-03
chi0_3 --> sel+   e-    0.110910378E-02  0.552921324E-03
chi0_3 --> ser-   e+    0.246760778E-02  0.123017609E-02
chi0_3 --> ser+   e-    0.246760778E-02  0.123017609E-02
chi0_3 --> smul-  mu+   0.110910378E-02  0.552921324E-03
chi0_3 --> smul+  mu-   0.110910378E-02  0.552921324E-03
chi0_3 --> smur-  mu+   0.246760778E-02  0.123017609E-02
chi0_3 --> smur+  mu-   0.246760778E-02  0.123017609E-02
chi0_3 --> stau1- tau+  0.102564660E-01  0.511315426E-02
chi0_3 --> stau1+ tau-  0.102564660E-01  0.511315426E-02
chi0_3 --> stau2- tau+  0.123261957E-01  0.614497627E-02
chi0_3 --> stau2+ tau-  0.123261957E-01  0.614497627E-02
chi0_3 --> snuel  nueb  0.612931864E-02  0.305564820E-02
chi0_3 --> snuelb nue   0.612931864E-02  0.305564820E-02
chi0_3 --> snuml  numb  0.612931864E-02  0.305564820E-02
chi0_3 --> snumlb num   0.612931864E-02  0.305564820E-02
chi0_3 --> snut1  nutb  0.617278270E-02  0.307731633E-02
chi0_3 --> snut1b nut   0.617278270E-02  0.307731633E-02

NEUTRALINO4 DECAYS   2.64075669
------------------
chi0_4 --> chi0_1 Z     0.565643473E-01  0.214197497E-01
chi0_4 --> chi0_2 Z     0.509039622E-01  0.192762788E-01
chi0_4 --> chi0_3 Z     0.000000000E+00  0.000000000E+00
chi0_4 --> chi+_1 W-    0.676136225E+00  0.256038819E+00
chi0_4 --> chi-_1 W+    0.676136225E+00  0.256038819E+00
chi0_4 --> chi+_2 W-    0.000000000E+00  0.000000000E+00
chi0_4 --> chi-_2 W+    0.000000000E+00  0.000000000E+00
chi0_4 --> chi0_1 h     0.182825275E+00  0.692321545E-01
chi0_4 --> chi0_1 H     0.000000000E+00  0.000000000E+00
chi0_4 --> chi0_1 A     0.000000000E+00  0.000000000E+00
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chi0_4 --> chi0_2 h     0.370967039E+00  0.140477554E+00
chi0_4 --> chi0_2 H     0.000000000E+00  0.000000000E+00
chi0_4 --> chi0_2 A     0.000000000E+00  0.000000000E+00
chi0_4 --> chi0_3 h     0.000000000E+00  0.000000000E+00
chi0_4 --> chi0_3 H     0.000000000E+00  0.000000000E+00
chi0_4 --> chi0_3 A     0.000000000E+00  0.000000000E+00
chi0_4 --> chi+_1 H-    0.000000000E+00  0.000000000E+00
chi0_4 --> chi-_1 H+    0.000000000E+00  0.000000000E+00
chi0_4 --> chi+_2 H-    0.000000000E+00  0.000000000E+00
chi0_4 --> chi-_2 H+    0.000000000E+00  0.000000000E+00
chi0_4 --> supl   ub    0.000000000E+00  0.000000000E+00
chi0_4 --> subl   up    0.000000000E+00  0.000000000E+00
chi0_4 --> supr   ub    0.000000000E+00  0.000000000E+00
chi0_4 --> subr   up    0.000000000E+00  0.000000000E+00
chi0_4 --> sdnl   db    0.000000000E+00  0.000000000E+00
chi0_4 --> sdbl   dn    0.000000000E+00  0.000000000E+00
chi0_4 --> sdnr   db    0.000000000E+00  0.000000000E+00
chi0_4 --> sdbr   dn    0.000000000E+00  0.000000000E+00
chi0_4 --> schl   cb    0.000000000E+00  0.000000000E+00
chi0_4 --> scbl   ch    0.000000000E+00  0.000000000E+00
chi0_4 --> schr   cb    0.000000000E+00  0.000000000E+00
chi0_4 --> scbr   ch    0.000000000E+00  0.000000000E+00
chi0_4 --> ssbl   st    0.000000000E+00  0.000000000E+00
chi0_4 --> sstl   sb    0.000000000E+00  0.000000000E+00
chi0_4 --> ssbr   st    0.000000000E+00  0.000000000E+00
chi0_4 --> sstr   sb    0.000000000E+00  0.000000000E+00
chi0_4 --> stop1  tb    0.000000000E+00  0.000000000E+00
chi0_4 --> stop1b tp    0.000000000E+00  0.000000000E+00
chi0_4 --> stop2  tb    0.000000000E+00  0.000000000E+00
chi0_4 --> stop2b tp    0.000000000E+00  0.000000000E+00
chi0_4 --> sbot1  bb    0.000000000E+00  0.000000000E+00
chi0_4 --> sbot1b bt    0.000000000E+00  0.000000000E+00
chi0_4 --> sbot2  bb    0.000000000E+00  0.000000000E+00
chi0_4 --> sbot2b bt    0.000000000E+00  0.000000000E+00
chi0_4 --> sel-   e+    0.248050272E-01  0.939315134E-02
chi0_4 --> sel+   e-    0.248050272E-01  0.939315134E-02
chi0_4 --> ser-   e+    0.100858682E-01  0.381930993E-02
chi0_4 --> ser+   e-    0.100858682E-01  0.381930993E-02
chi0_4 --> smul-  mu+   0.248050272E-01  0.939315134E-02
chi0_4 --> smul+  mu-   0.248050272E-01  0.939315134E-02
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```
chi0_4 --> smur-  mu+   0.100858682E-01  0.381930993E-02
chi0_4 --> smur+  mu-   0.100858682E-01  0.381930993E-02
chi0_4 --> stau1- tau+  0.781139886E-02  0.295801537E-02
chi0_4 --> stau1+ tau-  0.781139886E-02  0.295801537E-02
chi0_4 --> stau2- tau+  0.407738614E-01  0.154402189E-01
chi0_4 --> stau2+ tau-  0.407738614E-01  0.154402189E-01
chi0_4 --> snuel  nueb  0.649462007E-01  0.245937844E-01
chi0_4 --> snuelb nue   0.649462007E-01  0.245937844E-01
chi0_4 --> snuml  numb  0.649462007E-01  0.245937844E-01
chi0_4 --> snumlb num   0.649462007E-01  0.245937844E-01
chi0_4 --> snut1  nutb  0.653523551E-01  0.247475867E-01
chi0_4 --> snut1b nut   0.653523551E-01  0.247475867E-01
```