Running SuSpect (short user's manual)

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The program `Suspect` is composed of several files and routines:

i) The input files `suspect2.in` (standard format) or alternatively `suspect2_lha.in` (the SLHA format): here one can select the model to be investigated, the accuracy of the algorithm, the input data (SM fermion masses and gauge couplings). Some reasonable default values are set in the example of input file which is discussed in the next subsection. One would then simply select the SUSY model (pMSSM, mSUGRA, GMSB and AMSB), choose the corresponding input parameters and possibly make a few choices concerning the physical calculation (such as enforcing or not unification of the gauge couplings, changing the scale at which EWSB occurs, including or not radiative corrections to the masses and choosing the routine calculating the Higgs boson masses).

ii) The program `suspect2_call.f`: this is an example of a routine which calls the main subroutine `suspect2.f`. This program is necessary to run `SuSpect` since it defines the primary algorithm control input parameters needed by the latter. In particular, there is an important parameter (`INPUT`) which controls the form of input/output: depending on its value it allows to select the input and output either in the standard (`suspect2.in`) or in the SLHA (`suspect2_lha.in`) format, or alternatively to bypass the reading of any input files, in which case all the parameters and choices are to be defined by the user in this calling routine. This last choice is particularly useful for interfacing `SuSpect` with other routines and/or for scans of the parameter space.

iii) The main routine `suspect2.f`: here all the calculation of the spectrum is performed, once the input is supplied by `suspect2.in`, `suspect2_lha.in` or `suspect2_call.f`. This routine is self–contained, except for the determination of the Higgs boson masses, where it needs to call one additional routine for the two-loop contributions that we also supply: `twoloophiggs.f` (originally provided by Pietro Slavich). Note that we provide also as a separate file, needed in the compilation: `bsg.f`, performing the calculation of the $b \to s\gamma$ branching ratio (originally provided by Paolo Gambino).

iv) output files `suspect2.out` and `suspect2_`*lha*`.out`: these filee are generated by default [they can be switched off by an appropriate value of the control parameter `INPUT` in `suspect2_call.f`] at each run of the program and gives the results for the output soft SUSY–breaking parameters [when they are calculated] and the masses and mixing angles of the Higgs and SUSY particles. Some warnings and comments are also given when the obtained spectrum is problematic. A specific example of SLHA output file is given below.

The routine `suspect2.f` consists of about 10.000 lines of code and takes about 350 Ko of memory, while the input and the calling routines have only a few hundred lines (most of them being comments). The accompanying separate routine for the calculation of the two-loop radiative correction to the Higgs masses has about 7000 lines of code. The complete executable code takes about 0.9 Mo space.

The FORTRAN files have to be compiled altogether and, running for instance on a PC using GNU FORTRAN, the (minimal options) compilation and link commands are:

g77 -c suspect2_call.f suspect2.f twoloophiggs.f bsg.f

g77 -o suspect suspect2_call.o suspect2.o twoloophiggs.o bsg.o

suspect

no other compilation option is in principle needed, though some users might find useful to try other standard compilation options]. The running time for a typical model point, for instance the mSUGRA point discussed below, is about 1 second on a PC with a 1 GHz processor.

4.2 The input and output files

In this subsection, we exhibit the input and output files, taking as an example for the actual running the mSUGRA SPS1a point [this allows to compare with spectra given by other routines]:

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

Note however that the input file suspect2_lha.in, as reproduced below, contains examples of input setting for more general MSSM models as well. For convenience the example files are given in the now widely used SLHA (SUSY les Houches Accord) format; they are self–explanatory and will not be commented further. One can use alternatively the original `SuSpect` format input and output files, see the web site for examples.

The input file in the SLHA `SuSpect` format

```
# SUSY Les Houches Accord 1.0 - example input file for SUSPECT 2.3
Block MODSEL  # Select model:
#             Arbitrary soft-terms at low scale              : 0
#             Arbitrary soft-terms at high scale (large RGE)  : 1
#             mSUGRA (cMSSM)                                 : 10
#             GMSB   (cMSSM)                                 : 11
#             AMSB   (cMSSM)                                 : 12
    1   10  # mSUGRA
#
Block SU_ALGO  # !specific SUSPECT2.3 block: algorithm control parameters
```

```
    2    21  # 2-loop RGE (1-loop RGE is: 11 instead)
    3    1   # 1: g_1(gut) = g_2(gut) consistently calculated from input
#  NB other possibility is 0: High scale input (=HIGH in block EXTPAR below):
    4    2   # RGE accuracy: 1: moderate, 2: accurate (but slower)
    6    1    #  1: M_Hu, M_Hd input (default in constrained models)
#       (or 0: MA_pole, MU input instead: only possible in gen. MSSM!)
    8    1   # if = 1: Default EWSB scale=(mt_L*mt_R)^(1/2)
#         if = 0: arbitrary EWSB scale (give EWSB in Block EXTPAR below)
    9    2   # Final spectrum accuracy: 1 -> 1% acc.; 2 -> 0.01 % acc.
    10   2   # Higgs boson masses calculation options:
#            A simple approximation                          : 0
#            One-loop calculation                            : 1
#            One-loop  + dominant DSVZ 2-loop (recommended)    : 2
    11   0   # Higher order Higgs 'scheme' choice in rad. corr. at mZ:
#         RUNNING DRbar Higgs masses at loop-level at mZ (preferred!): 0
#         POLE          Higgs masses at loop-level at mZ             : 1
#
Block SMINPUTS   # Standard Model inputs
    1     127.934  # alpha_em^(-1)(MZ) SM MSbar
    3      0.1172  # alpha_s(MZ) SM MSbar
    5      4.25    # Mb(mb) SM MSbar
    6    178.      # Mtop(pole)
    7    1.777     # Mtau(pole)
#
Block MINPAR  # specific model input parameters
#   input for mSUGRA models (! comment (#) all other (GMSB,AMSB) lines):
    1    100.0   # m0
    2    250.0   # m1%2
    5  -100.0    # A0
    3     10.0   # tanbeta
    4      1.0   # sign(mu)
#   input for GMSB models (! comment (#) all other (mSUGRA,AMSB) lines):
#     1    100.d3  # Lambda_susy
#     2    200.d3  # Lambda_mess
#     3    15      # tanbeta
#     4    1.      # sign(MU)
#     5    1       # Nl_mes
#     6    1       # Nq_mes
#   input for AMSB models (! comment (#) all other (mSUGRA,GMSB) lines):
```

```
#     1    450.    # m0
#     2    60.d3   # M_3%2 gravitino mass
#     3    10.     # tanbeta
#     4    1.      # sign(MU)
#     5    1.      # cQ  : weight of m0 for Q_L (3rd gen.) doublet
#     6    1.      # cuR : weight of m0 for u_R
#     7    1.      # cdR : weight of m0 for d_R
#     8    1.      # cL  : weight of m0 for L (1st, 2d gen.) doublet
#     9    1.      # ceR : weight of m0 for e_R (1st, 2d gen.)
#     10   1.      # cHu : weight of m0 for Hu
#     11   1.      # cHd : weight of m0 for Hd
#
Block EXTPAR   # general MSSM input (!only 0 relevant in mSUGRA, GMSB, AMSB)
     0   1000.0   # EWSB_scale (!only relevant if above block su_algo 8 = 0)
#     10   2.d3   # HIGH_scale (RGE end) (!only relevant if non-GUT models)
     22   1.d4    # M^2_Hu
     21   1.d4    # M^2_Hd (split susy)
     25   10.     # tbeta
     26   1       # sign(mu)
     1    167.    # M1 U(1)_Y Bino mass
     2    333.    # M2 SU(2)_L Wino mass
     3    1000.    # M3 SU(3)_c gluino mass
     33   1.d3  # M_tau_L
     36   1.d3  # M_tau_R
     43   1.d3   # M_Q_L (3rd gen.)
     46   1.d3   # M_t_R
     49   1.d3    # M_b_R
     31   1.d3  # M_e_L (1st, 2d gen.)
     34   1.d3  # M_e_R (1st, 2d gen.)
     41   1.d3    # M_qu_L  (1st, 2d gen.)
     44   1.d3  # M_u_R (1st, 2d gen.)
     47   1.d3  # M_d_R (1st, 2d gen.)
     13   0.d3    # A_tau
     11   100.01  # A_t
     12   0.d3  # A_b
     16   0.d3    # A_e (1st, 2d gen.)
     14   0.d3  # A_u (1st, 2d gen.)
     15   0.d3  # A_d (1st, 2d gen.)
     24   1000.   # M_A(pole!)
```

```
    23   1000.    # MU(EWSB scale)
```

The output file in SLHA SuSpect format

```
#
#                               =====================
#                               | SuSpect 2.3 OUTPUT |
#                               =====================
#
#
#              -----------------------------------------------------
#              |  SUSY Les Houches Accord - MSSM Spectrum          |
#              |                                                   |
#              |                     SuSpect 2.3                   |
#              |                                                   |
#              |  Authors: A.Djouadi, J.-L. Kneur and G. Moultaka  |
#              |  Ref.:    hep-ph/0211331                          |
#              |                                                   |
#              -----------------------------------------------------
#
#
BLOCK SPINFO  # Spectrum Program information
     1   SuSpect     # RGE +Spectrum calculator
     2   2.3         # version number
# nothing to signal: output a priori reliable
#
BLOCK MODSEL  # Model selection
     1    10   mSUGRA
#
BLOCK MINPAR  # Input parameters
         1     1.00000000E+02   # m0
         2     2.50000000E+02   # m1%2
         3     1.00000000E+01   # tanbeta
         4     1.00000000E+00   # sign(mu)
         5    -1.00000000E+02   # A0
#
BLOCK EXTPAR  # Input parameters
     0     0.46374629E+03   # EWSB_scale
#
```

```
BLOCK SMINPUTS  # Standard Model inputs
         1     1.27934000E+02   # alpha_em^-1(M_Z)^MSbar
         2     1.16639000E-05   # G_F [GeV^-2]
         3     1.17200000E-01   # alpha_S(M_Z)^MSbar
         4     9.11870000E+01   # M_Z pole mass
         5     4.25000000E+00   # mb(mb)^MSbar
         6     1.78000000E+02   # mt pole mass
         7     1.77700000E+00   # mtau pole mass
#
BLOCK MASS  # Mass Spectrum
# PDG code           mass       particle
        24     8.05242299E+01   # W+
        25     1.12096757E+02   # h
        35     4.06461015E+02   # H
        36     4.06119958E+02   # A
        37     4.14275400E+02   # H+
         5     4.87884274E+00   # b pole mass calculated from mb(mb)_MSbar
   1000001     5.73065871E+02   # ~d_L
   2000001     5.46427885E+02   # ~d_R
   1000002     5.67624937E+02   # ~u_L
   2000002     5.47354466E+02   # ~u_R
   1000003     5.73065871E+02   # ~s_L
   2000003     5.46427885E+02   # ~s_R
   1000004     5.67624937E+02   # ~c_L
   2000004     5.47354466E+02   # ~c_R
   1000005     5.17365564E+02   # ~b_1
   2000005     5.47189785E+02   # ~b_2
   1000006     3.96386318E+02   # ~t_1
   2000006     5.86606824E+02   # ~t_2
   1000011     2.04342680E+02   # ~e_L
   2000011     1.45552503E+02   # ~e_R
   1000012     1.88743509E+02   # ~nu_eL
   1000013     2.04342680E+02   # ~mu_L
   2000013     1.45552503E+02   # ~mu_R
   1000014     1.88743509E+02   # ~nu_muL
   1000015     1.36017749E+02   # ~tau_1
   2000015     2.08433459E+02   # ~tau_2
   1000016     1.87856168E+02   # ~nu_tauL
   1000021     6.06917407E+02   # ~g
```

```
   1000022     9.73858252E+01   # ~chi_10
   1000023     1.81569768E+02   # ~chi_20
   1000025    -3.70511612E+02   # ~chi_30
   1000035     3.88598381E+02   # ~chi_40
   1000024     1.81025728E+02   # ~chi_1+
   1000037     3.88864824E+02   # ~chi_2+
#
BLOCK SU_LOWPAR  # Values constrained by exp data
         1     9.43651787E-05   # Delta rho parameter
         2     2.69830570E-09   # g_mu -2
         3     2.93287969E-04   # Br(b -> s gamma)
#
BLOCK SU_FINETUNE  # Fine-tuning info: fine-tuned if >>1
         1     3.33670230E+01   # delta mZ^2/mZ^2 (mu^2)
         2     8.32862088E-01   # delta mZ^2/mZ^2 (B.mu)
         3     1.66998357E+01   # delta mt/mt (mu^2)
         4     4.06330034E-01   # delta mt/mt  (B.mu)
#
BLOCK NMIX  # Neutralino Mixing Matrix
  1  1     9.86741624E-01   # N_11
  1  2    -5.29651707E-02   # N_12
  1  3     1.44339796E-01   # N_13
  1  4    -5.19777092E-02   # N_14
  2  1     9.82323496E-02   # N_21
  2  2     9.45644736E-01   # N_22
  2  3    -2.69126586E-01   # N_23
  2  4     1.53874361E-01   # N_24
  3  1     5.96137014E-02   # N_31
  3  2    -8.86534307E-02   # N_32
  3  3    -6.95821436E-01   # N_33
  3  4    -7.10224827E-01   # N_34
  4  1     1.14619284E-01   # N_41
  4  2    -3.08368761E-01   # N_42
  4  3    -6.50053408E-01   # N_43
  4  4     6.84982988E-01   # N_44
#
BLOCK UMIX  # Chargino Mixing Matrix U
  1  1    -9.19474141E-01   # U_11
  1  2     3.93150485E-01   # U_12
```

```
  2  1     3.93150485E-01   # U_21
  2  2     9.19474141E-01   # U_22
#
BLOCK VMIX  # Chargino Mixing Matrix V
  1  1    -9.74152159E-01   # V_11
  1  2     2.25892831E-01   # V_12
  2  1     2.25892831E-01   # V_21
  2  2     9.74152159E-01   # V_22
#
BLOCK STOPMIX  # Stop Mixing Matrix
  1  1     5.37997760E-01   # cos(theta_t)
  1  2     8.42946268E-01   # sin(theta_t)
  2  1    -8.42946268E-01   # -sin(theta_t)
  2  2     5.37997760E-01   # cos(theta_t)
#
BLOCK SBOTMIX  # Sbottom Mixing Matrix
  1  1     9.28724239E-01   # cos(theta_b)
  1  2     3.70771206E-01   # sin(theta_b)
  2  1    -3.70771206E-01   # -sin(theta_b)
  2  2     9.28724239E-01   # cos(theta_b)
#
BLOCK STAUMIX  # Stau Mixing Matrix
  1  1     2.84542686E-01   # cos(theta_tau)
  1  2     9.58663372E-01   # sin(theta_tau)
  2  1    -9.58663372E-01   # -sin(theta_tau)
  2  2     2.84542686E-01   # cos(theta_tau)
#
BLOCK ALPHA  # Higgs mixing
          -1.13466462E-01   # Mixing angle in the neutral Higgs boson sector
#
BLOCK HMIX Q=  4.63746294E+02  # DRbar Higgs Parameters
     1     3.64709278E+02   # mu(Q)
     2     9.73388470E+00   # tanbeta(Q)
#
BLOCK GAUGE Q=  4.63746294E+02  # The gauge couplings
     1     3.60880368E-01   # gprime(Q) DRbar
     2     6.46457261E-01   # g(Q) DRbar
     3     1.09622209E+00   # g_3(Q) DRbar
#
```

```
BLOCK Au Q=  4.63746294E+02  # The trilinear couplings
  1  1    -6.85856829E+02   # A_u(Q) DRbar
  3  3    -4.86788837E+02   # A_t(Q) DRbar
#
BLOCK Ad Q=  4.63746294E+02  # The trilinear couplings
  1  1    -8.65445010E+02   # A_d(Q) DRbar
  3  3    -7.94742941E+02   # A_b(Q) DRbar
#
BLOCK Ae Q=  4.63746294E+02  # The trilinear couplings
  1  1    -2.58052399E+02   # A_e(Q) DRbar
  3  3    -2.56294408E+02   # A_tau(Q) DRbar
#
BLOCK Yu Q=  4.63746294E+02  # The Yukawa couplings
#
BLOCK Yd Q=  4.63746294E+02  # The Yukawa couplings
#
BLOCK Ye Q=  4.63746294E+02  # The Yukawa couplings
  3  3     1.01034578E-01   # y_tau(Q) DRbar
  3  3     1.39418450E-01   # y_b(Q) DRbar
  3  3     9.11111063E-01   # y_top(Q) DRbar
#
BLOCK MSOFT Q=  4.63746294E+02  # soft SUSY breaking masses at the scale Q
         1     1.01440685E+02   # M_1
         2     1.91654123E+02   # M_2
         3     5.87084602E+02   # M_3
        21     3.24544114E+04   # M^2_Hd
        22    -1.33872747E+05   # M^2_Hu
        31     1.99111549E+02   # M_eL
        32     1.99111549E+02   # M_muL
        33     1.98270772E+02   # M_tauL
        34     1.38832978E+02   # M_eR
        35     1.38832978E+02   # M_muR
        36     1.36405190E+02   # M_tauR
        41     5.51255757E+02   # M_q1L
        42     5.51255757E+02   # M_q2L
        43     4.98463635E+02   # M_q3L
        44     5.29286276E+02   # M_uR
        45     5.29286276E+02   # M_cR
        46     4.15660713E+02   # M_tR
```

```
47      5.26532840E+02   # M_dR
48      5.26532840E+02   # M_sR
49      5.23233348E+02   # M_bR
```

Appendix A: The main routine and the control parameters

```
SUBROUTINE SUSPECT2(iknowl,input,ichoice,errmess)
```

is the main routine of the program, to be be used as it is or to be called by any other routine (such as `suspect2_call.f`, as will be discussed below). It has the following four basic input control parameters:

`IKNOWL`: which sets the degree of control on the various parts of the algorithm. It has two possible values:

- `IKNOWL=0`: blind use of the program, i.e. no control on any "algorithmic" parameter. Reasonable default values are set for the control parameters and the program gives just the results from the physical input.
- `IKNOWL=1`: in addition warning/error messages are collected in the `suspect2.out` file (this is the recommended choice in general).

`INPUT`: is for the physical input setting and can take the following values:

- `INPUT=0`: the model and option parameters `ichoice(1)-(10)` as well as the values of the input parameters are read off from the file `suspect2.in` in the original SuSpect format. The output is written in both `suspect2.out` and SLHA format `suspect2_lha.out` files.
- `INPUT=1`: the user defines all the relevant input choices and parameters within his calling program, *i.e. any reading of input file(s) is by passed.* The required list of parameters to be defined (with consistent names etc), can be found in the commons given below. The output is written in both `suspect2.out` and SLHA format `suspect2_lha.out` files.
- `INPUT=2`: the model and option parameters `ichoice(1)-(10)` as well as the values of the physical input parameters are read off from the file `suspect2_lha.in` in the SLHA format. The output is written in both `suspect2.out` and SLHA format `suspect2_lha.out` files.
- `INPUT=11`: same as `INPUT=1`, but with no output file(s) written (note this option may be more convenient e.g. for scans of the MSSM parameter space).

`ICHOICE`: initializes the various options for the models to be considered, the degree of accuracy to be required, the features to be included, etc. There are 11 possible choices at present and the options are described in more detail in the input files `suspect2.in` or `suspect2_lha.in`:

- `ICHOICE(1)`: Choice of the model to be considered.

– `ICHOICE(2)`: For the perturbative order (1 or 2 loop) of the RGEs.
– `ICHOICE(3)`: To impose or not the GUT scale.
– `ICHOICE(4)`: For the accuracy of the RGEs.
– `ICHOICE(5)`: To impose or not the radiative EWSB.
– `ICHOICE(6)`: To chose different input in general MSSM.
– `ICHOICE(7)`: For the radiative corrections to the (s)particles masses.
– `ICHOICE(8)`: To set the value of the EWSB scale.
– `ICHOICE(9)`: For the final accuracy in the spectrum calculation (two possibities).
– `ICHOICE(10)`: For the approximation in calculating the Higgs boson masses (approximate, one-loop, or two-loop).

`ERRMESS`: which provides a useful set of warning/error message flags, that are automatically written in the output files `suspect2.out` or `suspect2_lha.out`:

– `ERRMESS(i)= 0`: Everything is fine,
– `ERRMESS(1)=-1`: tachyon 3rd gen. sfermion from RGE,
– `ERRMESS(2)=-1`: tachyon 1,2 gen. sfermion from RGE,
– `ERRMESS(3)=-1`: tachyon A boson (maybe temporary: see final mass),
– `ERRMESS(4)=-1`: tachyon 3rd gen. sfermion from mixing,
– `ERRMESS(5)=-1`: $\mu(M_{\rm GUT})$ guess inconsistent,
– `ERRMESS(6)=-1`: non–convergent μ from EWSB,
– `ERRMESS(7)=-1`: EWSB maybe inconsistent (! but RG-improved only check),
– `ERRMESS(8)=-1`: $V_{\rm Higgs}$ maybe UFB or CCB (! but RG-improved only check),
– `ERRMESS(9)=-1`: Higgs boson masses are NaN,
– `ERRMESS(10)=-1`: RGE problems (non-pert and/or Landau poles).

Appendix B: List of the various COMMONs

We list below some of the `COMMON` blocks used in the program with some short explanations. These `COMMON`s for the input and output parameters are important since they are possibly called by `suspect_call.f` and are all that is needed for interfacing with other codes. (NB there are many other COMMON blocks in SuSpect that are of internal use only, and thus not needed and not recommended in principle for any standard interface).

The COMMONs for input parameters:

Standard Model input parameters (couplings and fermion masses):

`COMMON/SU_SMPAR/alfinv,sw2,alphas,mt,mb,mtau`

RG evolution scale parameters (EWSB scale, high and low RGE ends):

`COMMON/SU_RGSCAL/qewsb,ehigh,elow`

Soft SUSY–breaking MSSM parameters of the scalar potential:

`COMMON/SU_MSSMHPAR/mhu2,mhd2,MA,MU`

The U(1), SU(2), SU(3) SUSY–breaking gaugino masses:

`COMMON/SU_MSSMGPAR/m1,m2,m3`

The soft-SUSY breaking slepton mass terms (3d and then 1/2 generations):

`COMMON/SU_MSSMSLEP/msl,mtaur,mel,mer`

The soft-SUSY breaking squark mass terms (3d and then 1/2 generations):

`COMMON/SU_MSSMSQUA/msq,mtr,mbr,muq,mur,mdr`

The soft-SUSY breaking trilinear couplings (3d and then 1/2 generations):

`COMMON/SU_ATRI3/al,au,ad`

`COMMON/SU_ATRI12/al1,au1,ad1`

The sign of μ and the input $\tan\beta$ value:

`COMMON/SU_RADEWSB/sgnmu0,tgbeta`

mSUGRA case input parameters:

`COMMON/SU_MSUGRA/m0,mhalf,a0`

GMSB case input parameters:

`COMMON/SU_GMSB/mgmmess,mgmsusy,nl,nq`

AMSB case input parameters:

`COMMON/SU_AMSB/m32,am0,cq,cu,cd,cl,ce,chu,chd`

The COMMONs for output masses, mixing angles and others

Light h, heavy H, charged Higgs H^+ Higgs masses and mixing angle α:

`COMMON/SU_OUTHIGGS/ml,mh,mch,alfa`

Charginos $\chi^\pm_{1,2}$ masses, neutralinos $\chi^0_{1..4}$ masses, gluino $\tilde{g}$ mass:

`COMMON/SU_OUTGINOS/mc1,mc2,mn1,mn2,mn3,mn4,mgluino`

Stop $\tilde{t}_{1,2}$ masses and Sup $\tilde{u}_{1,2}$, Scharm $\tilde{c}_{1,2}$ masses:

`COMMON/SU_OUTSQU/mst1,mst2,msu1,msu2`

Sbottom $\tilde{b}_{1,2}$ masses and Sdown $\tilde{d}_{1,2}$, Sstrange $\tilde{s}_{1,2}$ masses:

`COMMON/SU_OUTSQD/msb1,msb2,msd1,msd2`

Stau $\tilde{\tau}_{1,2}$ masses and Selectron $\tilde{e}_{1,2}$, Smuon $\tilde{s}_{1,2}$ and Sneutrino masses:

```
COMMON/SU_OUTSLEP/msl1,msl2,mse1,mse2,msn1,msntau
```

Stop, sbottom, stau mixing angles:

```
COMMON/SU_MIX/thet,theb,thel
```

The values of $\tan\beta$ and the angle α at the EWSB scale:

```
COMMON/SU_HMIX/beta,alfa
```

U, V chargino and Z neutralino diagonalyzing matrices:

```
COMMON/SU_MATINO/U,V,Z
```

Final bottom, top tau masses and gauge couplings at EWSB scale:

```
COMMON/SU_YUKAEWSB/ytauewsb,ybewsb,ytewsb,alsewsb,g2ewsb,g1ewsb
```

Running masses of tau,b,top in DRbar scheme at Q= EWSB scale: (may be useful)

```
COMMON/SU_runmewsb/mtaurewsb,mbrewsb,mtrewsb
```

Low-energy constrained quantities : $\Delta\rho \equiv \rho - 1$, $g_\mu - 2$, $\mathrm{Br}(b \to s\gamma)$:

```
COMMON/SU_lowen/crho,gmuon,brsg
```