```
*==> dvchino.f <==
**********************************************
*                                            *
*   Field dependent masses for charginos     *
*                                            *
*   chs(4,4)      Mass matrix                *
*   dc2(4)        Array of squere eigenvalues  *
*                                            *
**********************************************
      SUBROUTINE dvchino(rmu,rm2,g2,x1,x2,dc2)
      IMPLICIT DOUBLE PRECISION (a-h,o-z)
      PARAMETER(n=4,np=4)
      DOUBLE PRECISION chs(4,4),dc(4),e(4),z(4,4),dc2(4)
C
      do  m1=1,np
         do  m2=1,np
            chs(m1,m2)=0.d0
         enddo
      enddo
      chs(1,3)=rm2
      chs(1,4)=-g2*x1
      chs(2,3)=-g2*x2
      chs(2,4)=rmu
      do  n1=2,np
         do  n2=1,n1-1
            chs(n1,n2)=chs(n2,n1)   !  Symmetric matrix
         enddo
      enddo
      call tred2(chs,n,np,dc,e)
      call tqli(dc,e,n,np,z)
C-----------------------------------------------
C   Array dc contains the masses. We need squeres.
C-----------------------------------------------
      do  k=1,np
         dc2(k)=dc(k)*dc(k)
      enddo
C
      return
      END

*==> dvferm.f <==
*******************************************
*                                         *
*   Field dependent mass for fermions     *
*                                         *
*   y     :  Yukawa                       *
*   x     :  Vev                          *
*   sqe   :  Squere mass eigenvalue       *
*                                         *
*   y    |x                               *
*   ---- |----------------                *
*   yl1  |x1                              *
*   yl2  |x1    Leptons                   *
*   yl3  |x1                              *
*   ---- |----------------                *
*   yu1  |x2                              *
*   yu2  |x2    UP Quarks                 *
*   yu3  |x2                              *
*   ---- |----------------                *
*   yd1  |x1                              *
*   yd2  |x1   DOWN Quarks                *
*   yd3  |x1                              *
```



```
*                                         *
*******************************************
      SUBROUTINE dvferm(y,x,sqe)
      IMPLICIT DOUBLE PRECISION (a-h,o-z)
C
      sqe=(y*x)**2
C
      return
      END

*==> dvgabo.f <==
*********************************************
*                                           *
*   Field dependent mass for gauge bosons   *
*                                           *
*            g2*g2            W             *
*          /                                *
*    cf --                                  *
*          \                                *
*            g*g + g2*g2      Z             *
*                                           *
*    x1,x2   Independent variables          *
*    sqe     Squere eigenvalue              *
*                                           *
*********************************************
      SUBROUTINE dvgabo(cf,x1,x2,sqe)
      IMPLICIT DOUBLE PRECISION (a-h,o-z)
C
      sqe=cf*(x1**2+x2**2)/2.d0
C
      return
      END

*==> dvhig.f <==
**********************************************
*                                            *
*   Field dependent masses for higgs sector  *
*                                            *
*   h1(4,4)     Mass matrix                  *
*   h2(4,4)     Mass matrix                  *
*                                            *
*   sh1(4)      Array of squere eigenvalues  *
*   sh2(4)      Array of squere eigenvalues  *
*                                            *
*   sm1 -> sqm1                              *
*   sm2 -> sqm2                              *
*   sm3 -> sqm3                              *
*                                            *
**********************************************
      SUBROUTINE dvhig(sm1,sm2,sm3,g,g2,x1,x2,sh1,sh2)
      IMPLICIT DOUBLE PRECISION (a-h,o-z)
      PARAMETER(n=4,np=4)
      DOUBLE PRECISION hm1(4,4),sh1(4),e1(4),z1(4,4)
      DOUBLE PRECISION hm2(4,4),sh2(4),e2(4),z2(4,4)
C
      sco=g*g + g2*g2
C
      chi=sm1 + sco*dfx( dsqrt(2.d0)*x1 , x2)/4.d0
      psi=sm1 + sco*dfx(x1,x2)/4.d0 + g2*g2*x2*x2/2.d0
      zed=-sco*x1*x2/4.d0
C
      wmeg=sco*x1*x1/4.d0
```

```
      alph=sm3 - sco*x1*x2/4.d0
      bet=sm2 + sco*dfx(x2,x1)/4.d0 + g2*g2*x1*x1/2.d0
C
      gama=sm2 + sco*dfx( dsqrt(2.d0)*x2 , x1)/4.d0
      delt=sco*x2*x2/4.d0
      th=-sm3 + g2*g2*x1*x2/2.d0
C
      do  j=1,4
         do k=1,4
           hm1(j,k)=0.d0
         enddo
      enddo
      hm1(1,1)=psi
      hm1(1,4)=th
      hm1(2,2)=bet
      hm1(2,3)=th
      hm1(3,2)=th
      hm1(3,3)=psi
      hm1(4,1)=th
      hm1(4,4)=bet
C
C
      hm2(1,1)=chi
      hm2(1,2)=zed
      hm2(1,3)=wmeg
      hm2(1,4)=alph
      hm2(2,2)=gama
      hm2(2,3)=alph
      hm2(2,4)=delt
      hm2(3,3)=chi
      hm2(3,4)=zed
      hm2(4,4)=gama
      do  m1=2,4
         do  m2=1,m1-1
            hm2(m1,m2)=hm2(m2,m1)   !  Symmetric matrix
         enddo
      enddo
      call tred2(hm1,n,np,sh1,e1)
      call tqli(sh1,e1,n,np,z1)
C
      call tred2(hm2,n,np,sh2,e2)
      call tqli(sh2,e2,n,np,z2)
C
      return
      END

*==> dvneutr.f <==
**********************************************
*                                            *
*   Field dependent masses for neutralinos   *
*                                            *
*   tn(4,4)     Mass matrix                  *
*   dm2(4)       Array of squere eigenvalues *
*                                            *
**********************************************
      SUBROUTINE dvneutr(g,g2,rmu,rm1,rm2,x1,x2,dm2)
      IMPLICIT DOUBLE PRECISION (a-h,o-z)
      PARAMETER (n=4,np=4)
      DOUBLE PRECISION tn(4,4),dm(4),e(4),z(4,4),dm2(4)
C
      tn(1,1)=rm1
      tn(1,2)=0.d0
```



```
      tn(1,3)=g*x1/dsqrt(2.d0)
      tn(1,4)=-g*x2/dsqrt(2.d0)
      tn(2,2)=rm2
      tn(2,3)=-g2*x1/dsqrt(2.d0)
      tn(2,4)=g2*x2/dsqrt(2.d0)
      tn(3,3)=0.d0
      tn(3,4)=-rmu
      tn(4,4)=0.d0
        do  i1=2,4
           do   i2=1,i1-1
               tn(i1,i2)=tn(i2,i1)   ! Symmetric matrix
           enddo
        enddo
        call tred2(tn,n,np,dm,e)
        call tqli(dm,e,n,np,z)
C-------------------------------------------------
C   Array dc contains the masses. We need squeres.
C-------------------------------------------------
      do  k=1,4
         dm2(k)=dm(k)*dm(k)
      enddo
C
      return
      END

*==> dvslept.f <==
********************************************
*                                          *
*   Field dependent masses for sleptons    *
*                                          *
*   y           Yukawa                     *
*   a           Trilinear                  *
*   slt(2,2)    Mass matrix                *
*   sq1         Eigenvalue                 *
*   sq2         Eigenvalue                 *
*                                          *
*                                          *
*   sm2    |  smc2    |  y    |  a         *
*   ------|---------|------|------         *
*   sqml1 | sqmec1  | yl1  | al1           *
*   sqml2 | sqmec2  | yl2  | al2           *
*   sqml3 | sqmec3  | yl3  | al3           *
*                                          *
********************************************
      SUBROUTINE dvslept(sm2,smc2,y,a,rmu,g,g2,x1,x2,sq1,sq2)
      IMPLICIT DOUBLE PRECISION (a-h,o-z)
      PARAMETER(n=2,np=2)
      DOUBLE PRECISION slt(2,2),dl2(2),e(2),z(2,2)
C
      slt(1,1)=smc2 + (y*x1)**2 + g*g*dfx(x2,x1)/2.d0
      slt(1,2)=y*(a*x1 + rmu*x2)
      slt(2,1)=y*(a*x1 + rmu*x2)
      slt(2,2)=sm2 + (y*x1)**2 + dfx(g,g2)*dfx(x1,x2)/4.d0
C
      call tred2(slt,n,np,dl2,e)
      call tqli(dl2,e,n,np,z)
C
      sq1=dl2(1)
      sq2=dl2(2)
C
      return
      END
```

```
*==> dvsnet.f <==
**********************************************
*                                            *
*   Field dependent masses for sneutrinos    *
*                                            *
*   sfm2      Soft mass                      *
*   sqe       Mass squered                   *
*                                            *
*   sfm2 : {sqml1, sqml2, sqml3}             *
**********************************************
      SUBROUTINE dvsnet(sfm2,g,g2,x1,x2,sqe)
      IMPLICIT DOUBLE PRECISION (a-h,o-z)
C
      sco=g*g + g2*g2
      sqe=sfm2 + sco*dfx(x1,x2)/4.d0
C
      return
      END

*==> dvsqd.f <==
********************************************
*                                          *
*   Field dependent masses for DOWN quarks *
*                                          *
*   y            Yukawa                    *
*   a            Trilinear                 *
*   sq(2,2)      Mass matrix               *
*   dsq1         Eigenvalue                *
*   dsq2         Eigenvalue                *
*                                          *
*                                          *
*   sm2   |  smc2    |  y    |  a          *
*   ------|----------|-------|------       *
*   sqmq1 | sqmdc1   | yd1   | ad1         *
*   sqmq2 | sqmdc2   | yd2   | ad2         *
*   sqmq3 | sqmdc3   | yd3   | ad3         *
*                                          *
********************************************
      SUBROUTINE dvsqd(sm2,smc2,y,a,rmu,g,g2,x1,x2,dsq1,dsq2)
      IMPLICIT DOUBLE PRECISION (a-h,o-z)
      PARAMETER(n=2,np=2)
      DOUBLE PRECISION sq(2,2),dq2(2),e(2),z(2,2)
C
      gsum=g*g + 3.d0*g2*g2
C
      sq(1,1)=smc2 + (y*x1)**2 + g*g*dfx(x2,x1)/6.d0
      sq(1,2)=y*(a*x1 + rmu*x2)
      sq(2,1)=y*(a*x1 + rmu*x2)
      sq(2,2)=sm2 + (y*x1)**2 + gsum*dfx(x2,x1)/12.d0
C
C
      call tred2(sq,n,np,dq2,e)
      call tqli(dq2,e,n,np,z)
C
      dsq1=dq2(1)
      dsq2=dq2(2)
C
      return
      END

*==> dvsqu.f <==
```



```
********************************************
*                                          *
*   Field dependent masses for UP quarks   *
*                                          *
*   y            Yukawa                    *
*   a            Trilinear                 *
*   sq(2,2)      Mass matrix               *
*   usq1         Eigenvalue                *
*   usq2         Eigenvalue                *
*                                          *
*                                          *
*   sm2   |  smc2    |  y    |  a          *
*   ------|----------|-------|------       *
*   sqmq1 | sqmuc1   | yu1   | au1         *
*   sqmq2 | sqmuc2   | yu2   | au2         *
*   sqmq3 | sqmuc3   | yu3   | au3         *
*                                          *
********************************************
      SUBROUTINE dvsqu(sm2,smc2,y,a,rmu,g,g2,x1,x2,usq1,usq2)
      IMPLICIT DOUBLE PRECISION (a-h,o-z)
      PARAMETER(n=2,np=2)
      DOUBLE PRECISION sq(2,2),dq2(2),e(2),z(2,2)
C
      sq(1,1)=smc2 + (y*x2)**2 - g*g*dfx(x2,x1)/3.d0
      sq(1,2)=-y*(rmu*x1 + a*x2)
      sq(2,1)=-y*(rmu*x1 + a*x2)
      tal=dfx( g , dsqrt(3.d0)*g2 )*dfx(x2,x1)/12.d0
      sq(2,2)=sm2 + (y*x2)**2 + tal
C
C
      call tred2(sq,n,np,dq2,e)
      call tqli(dq2,e,n,np,z)
C
      usq1=dq2(1)
      usq2=dq2(2)
C
      return
      END
```