In[13]:=
```
(*Author C.Gatti*)
(* smearing parameters *)
(* p1_MS, p2_MS, p1_ID,p2_ID *)
(* Wms=(p1_MS g1 + p2_MS +g2*ptms) *)
(* Wid=(p1_ID g3 + p2_ID *g4 *ptid) *)
(*2x4 matrix of derivatives*)
DWDp = {{g1, g2 * ptms, 0, 0}, {0, 0, g3, g4 * ptid}}
Vp = {{s1^2, s1 s2 rho12, s1 s3 rho13, s1 s4 rho14},
      {s1 s2 rho12, s2^2, s2 s3 rho23 , s2 s4 rho24},
      {s1 s3 rho13, s2 s3 rho23 , s3^2 , s3 s4 rho34},
      {s1 s4 rho14, s2 s4 rho24, s3 s4 rho34 , s4^2 }}

DWDpT = Transpose[DWDp]
W = DWDp.Vp.DWDpT
Simplify[W]
```

Out[13]=
$$\begin{pmatrix} g1 & g2\ ptms & 0 & 0 \\ 0 & 0 & g3 & g4\ ptid \end{pmatrix}$$

Out[14]=
$$\begin{pmatrix} s1^2 & rho12\ s1\ s2 & rho13\ s1\ s3 & rho14\ s1\ s4 \\ rho12\ s1\ s2 & s2^2 & rho23\ s2\ s3 & rho24\ s2\ s4 \\ rho13\ s1\ s3 & rho23\ s2\ s3 & s3^2 & rho34\ s3\ s4 \\ rho14\ s1\ s4 & rho24\ s2\ s4 & rho34\ s3\ s4 & s4^2 \end{pmatrix}$$

Out[15]=
$$\begin{pmatrix} g1 & 0 \\ g2\ ptms & 0 \\ 0 & g3 \\ 0 & g4\ ptid \end{pmatrix}$$

Out[16]=
$$\begin{pmatrix} g1\left(g1\ s1^2 + g2\ ptms\ rho12\ s2\ s1\right) + g2\ ptms\left(g2\ ptms\ s2^2 + g1\ rho12\ s1\ s2\right) & g3\ (g1\ rho13\ s1\ s3 + g2\ ptms\ rho23\ s2\ s3) + g4\ ptid\ (g1\ rho14\ s1\ s4 + g2\ ptms\ rho24\ s2\ s4) \\ g1\ (g3\ rho13\ s1\ s3 + g4\ ptid\ rho14\ s1\ s4) + g2\ ptms\ (g3\ rho23\ s2\ s3 + g4\ ptid\ rho24\ s2\ s4) & g3\left(g3\ s3^2 + g4\ ptid\ rho34\ s4\ s3\right) + g4\ ptid\left(g4\ ptid\ s4^2 + g3\ rho34\ s3\ s4\right) \end{pmatrix}$$

Out[17]=
$$\begin{pmatrix} g1^2\ s1^2 + 2\ g1\ g2\ ptms\ rho12\ s2\ s1 + g2^2\ ptms^2\ s2^2 & g1\ s1\ (g3\ rho13\ s3 + g4\ ptid\ rho14\ s4) + g2\ ptms\ s2\ (g3\ rho23\ s3 + g4\ ptid\ rho24\ s4) \\ g1\ s1\ (g3\ rho13\ s3 + g4\ ptid\ rho14\ s4) + g2\ ptms\ s2\ (g3\ rho23\ s3 + g4\ ptid\ rho24\ s4) & g3^2\ s3^2 + 2\ g3\ g4\ ptid\ rho34\ s4\ s3 + g4^2\ ptid^2\ s4^2 \end{pmatrix}$$

In[19]:=
```
CForm[W]
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Out[19]//CForm=
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List(List(g1*(g1*Power(s1,2) + g2*ptms*rho12*s1*s2) + g2*ptms*(g1*rho12*s1*s2 + g2*ptms*Power(s2,2)),
    g3*(g1*rho13*s1*s3 + g2*ptms*rho23*s2*s3) + g4*ptid*(g1*rho14*s1*s4 + g2*ptms*rho24*s2*s4)),
   List(g1*(g3*rho13*s1*s3 + g4*ptid*rho14*s1*s4) + g2*ptms*(g3*rho23*s2*s3 + g4*ptid*rho24*s2*s4),
    g3*(g3*Power(s3,2) + g4*ptid*rho34*s3*s4) + g4*ptid*(g3*rho34*s3*s4 + g4*ptid*Power(s4,2))))
```