In[2]:=
```
/ * ap1  →  ΔXp / δX
/ * ap2  →  ΔXp / δY
/ * ap3  →  ΔXp / δα
/ * ap4  →  ΔXp / δβ
```

In[2]:=
```
/ * am1  →  ΔXm / δX
/ * am2  →  ΔXm / δY
/ * am3  →  ΔXm / δα
/ * am4  →  ΔXm / δβ
```

In[2]:=
```
/ * bp1  →  ΔYp / δX
/ * bp2  →  ΔYp / δY
/ * bp3  →  ΔYp / δα
/ * bp4  →  ΔYp / δβ
```

In[2]:=
```
/ * bm1  →  ΔYm / δX
/ * bm2  →  ΔYm / δY
/ * bm3  →  ΔYm / δα
/ * bm4  →  ΔYm / δβ
```

In[2]:=
```
am1[bpm_] := ap1[bpm]
am2[bpm_] := -ap2[bpm]
am3[bpm_] := ap3[bpm]
am4[bpm_] := -ap4[bpm]
```

In[6]:=
```
bm1[bpm_] := -bp1[bpm]
bm2[bpm_] := bp2[bpm]
bm3[bpm_] := -bp3[bpm]
bm4[bpm_] := bp4[bpm]
```

In[10]:=
```
ΔXp[bpm_] := δX ap1[bpm] + δY ap2[bpm] + δα ap3[bpm] + δβ ap4[bpm]
ΔXm[bpm_] := δX am1[bpm] + δY am2[bpm] + δα am3[bpm] + δβ am4[bpm]
```

In[12]:=
```
ΔYp[bpm_] := δX bp1[bpm] + δY bp2[bpm] + δα bp3[bpm] + δβ bp4[bpm]
ΔYm[bpm_] := δX bm1[bpm] + δY bm2[bpm] + δα bm3[bpm] + δβ bm4[bpm]
```

In[14]:=
```
XS[bpm_] := ΔXp[bpm] + ΔXm[bpm]
XM[bpm_] := ΔXp[bpm] - ΔXm[bpm]
```

In[16]:=
```
YS[bpm_] := ΔYp[bpm] + ΔYm[bpm]
YM[bpm_] := ΔYp[bpm] - ΔYm[bpm]
```

In[18]:=
```
Solve[{XS[1] == Δxp[1] + Δxm[1], XM[1] == Δxp[1] - Δxm[1],
  YS[1] == Δyp[1] + Δym[1], YM[1] == Δyp[1] - Δym[1],
  XS[2] == Δxp[2] + Δxm[2], XM[2] == Δxp[2] - Δxm[2],
  YS[2] == Δyp[2] + Δym[2], YM[2] == Δyp[2] - Δym[2]},
 {δX, δY, δα, δβ}]
```

Out[18]=
```
{ }
```

In[19]:=
```
Solve[{XS[1] == Δxp[1] + Δxm[1], XM[1] == Δxp[1] - Δxm[1],
  YS[1] == Δyp[1] + Δym[1], YM[1] == Δyp[1] - Δym[1]},
 {δX, δY, δα, δβ}]
```

Out[19]=
$$\left\{\left\{\delta X \to \frac{-bp3[1]\,\Delta xm[1] - bp3[1]\,\Delta xp[1] - ap3[1]\,\Delta ym[1] + ap3[1]\,\Delta yp[1]}{2\,(ap3[1]\,bp1[1] - ap1[1]\,bp3[1])},\right.\right.$$
$$\delta\alpha \to -\frac{-bp1[1]\,\Delta xm[1] - bp1[1]\,\Delta xp[1] - ap1[1]\,\Delta ym[1] + ap1[1]\,\Delta yp[1]}{2\,(ap3[1]\,bp1[1] - ap1[1]\,bp3[1])},$$
$$\delta Y \to -\frac{-bp4[1]\,\Delta xm[1] + bp4[1]\,\Delta xp[1] - ap4[1]\,\Delta ym[1] - ap4[1]\,\Delta yp[1]}{2\,(ap4[1]\,bp2[1] - ap2[1]\,bp4[1])},$$
$$\left.\left.\delta\beta \to -\frac{bp2[1]\,\Delta xm[1] - bp2[1]\,\Delta xp[1] + ap2[1]\,\Delta ym[1] + ap2[1]\,\Delta yp[1]}{2\,(ap4[1]\,bp2[1] - ap2[1]\,bp4[1])}\right\}\right\}$$

In[20]:=
```
Solve[{XS[2] == Δxp[2] + Δxm[2], XM[2] == Δxp[2] - Δxm[2],
  YS[2] == Δyp[2] + Δym[2], YM[2] == Δyp[2] - Δym[2]},
 {δX, δY, δα, δβ}]
```

Out[20]=
$$\left\{\left\{\delta X \to \frac{-bp3[2]\,\Delta xm[2] - bp3[2]\,\Delta xp[2] - ap3[2]\,\Delta ym[2] + ap3[2]\,\Delta yp[2]}{2\,(ap3[2]\,bp1[2] - ap1[2]\,bp3[2])},\right.\right.$$
$$\delta\alpha \to -\frac{-bp1[2]\,\Delta xm[2] - bp1[2]\,\Delta xp[2] - ap1[2]\,\Delta ym[2] + ap1[2]\,\Delta yp[2]}{2\,(ap3[2]\,bp1[2] - ap1[2]\,bp3[2])},$$
$$\delta Y \to -\frac{-bp4[2]\,\Delta xm[2] + bp4[2]\,\Delta xp[2] - ap4[2]\,\Delta ym[2] - ap4[2]\,\Delta yp[2]}{2\,(ap4[2]\,bp2[2] - ap2[2]\,bp4[2])},$$
$$\left.\left.\delta\beta \to -\frac{bp2[2]\,\Delta xm[2] - bp2[2]\,\Delta xp[2] + ap2[2]\,\Delta ym[2] + ap2[2]\,\Delta yp[2]}{2\,(ap4[2]\,bp2[2] - ap2[2]\,bp4[2])}\right\}\right\}$$

In[21]:=
```
FortranForm[dX = (-bp3[1] Δxm[1] - bp3[1] Δxp[1] - ap3[1] Δym[1] + ap3[1] Δyp[1])/
   (2 (ap3[1] bp1[1] - ap1[1] bp3[1]))]
```

Out[21]//FortranForm=
```
dX = (-(bp3(1)*Δxm(1)) - bp3(1)*Δxp(1) - ap3(1)*Δym(1) + ap3(1)*Δyp(1))/
-  (2.*(ap3(1)*bp1(1) - ap1(1)*bp3(1)))
```

In[22]:=
```
FortranForm[dY = -(-bp1[1] Δxm[1] - bp1[1] Δxp[1] - ap1[1] Δym[1] + ap1[1] Δyp[1])/
   (2 (ap3[1] bp1[1] - ap1[1] bp3[1]))]
```

Out[22]//FortranForm=
```
dY = -(-(bp1(1)*Δxm(1)) - bp1(1)*Δxp(1) - ap1(1)*Δym(1) + ap1(1)*Δyp(1))/
-  (2.*(ap3(1)*bp1(1) - ap1(1)*bp3(1)))
```

In[23]:=
```
FortranForm[dAlpha = (-bp4[1] Δxm[1] + bp4[1] Δxp[1] - ap4[1] Δym[1] - ap4[1] Δyp[1])/
   (2 (ap4[1] bp2[1] - ap2[1] bp4[1])) * (-1)]
```

Out[23]//FortranForm=
```
dAlpha = -(-(bp4(1)*Δxm(1)) + bp4(1)*Δxp(1) - ap4(1)*Δym(1) - ap4(1)*Δyp(1))/
-  (2.*(ap4(1)*bp2(1) - ap2(1)*bp4(1)))
```

In[24]:=
$$\texttt{FortranForm}\left[\texttt{dBeta} = -\frac{\texttt{bp2[1]}\ \Delta\texttt{xm[1]} - \texttt{bp2[1]}\ \Delta\texttt{xp[1]} + \texttt{ap2[1]}\ \Delta\texttt{ym[1]} + \texttt{ap2[1]}\ \Delta\texttt{yp[1]}}{2\ (\texttt{ap4[1]}\ \texttt{bp2[1]} - \texttt{ap2[1]}\ \texttt{bp4[1]})}\right]$$

Out[24]//FortranForm=

```
-(bp2(1)*△xm(1) - bp2(1)*△xp(1) + ap2(1)*△ym(1) + ap2(1)*△yp(1))/
-  (2.*(ap4(1)*bp2(1) - ap2(1)*bp4(1)))
```

In[25]:= **ap1[1] := 0.5**

In[26]:= **ap2[1] := 0.1**

In[27]:= **ap3[1] := 0.1**

In[28]:= **ap4[1] := 1.4**

In[29]:= **bp1[1] := -0.1**

In[30]:= **bp2[1] := 0.5**

In[31]:= **bp3[1] := -1.4**

In[32]:= **bp4[1] := 0.1**

In[33]:= **Δxp[1] := 2.1**

In[34]:= **Δxm[1] := -0.9**

In[35]:= **Δyp[1] := -0.9**

In[36]:= **Δym[1] := 2.1**