

Polarization Effects - Higgs

Assuming

- Electron Polarization of 80%
- Positron Polarization of 45% (without any loss in $R!$)

Questions:

- Which Electron Polarization is needed? From beginning?
- Is Positron Polarization needed? From beginning?
- Which accuracy in P_{e^-} and P_{e^+} is needed? $\rightarrow 0.5 - 1\%$
- What do you want for the TDR??

$$e^+e^- \rightarrow HZ, hA, HA, H^+H^- :$$

P_{e^-}	P_{e^+}	factor (with 100% Pol.)	with 80% e^- , 60% e^+
0	0	1	1
+1	0	0.00	0.87
-1	0	1.16	1.13
+1	-1	1.68	1.26
-1	+1	2.32	1.70

Scaling factor

from $P_{e^-} = 60\% \rightarrow 45\%$

or 0.9!

$$e^+e^- \rightarrow H\nu\bar{\nu} \text{ (WW-Fusion):}$$

P_{e^-}	P_{e^+}	factor (with 100% Pol.)	with 80% e^- , 60% e^+
0	0	1	1
+1	0	0	0.2
-1	0	2	1.3
+1	-1	0	0.08
-1	+1	4	2.88

background:

$$e^+e^- \rightarrow WW:$$

a bit more complicated due to s/t-channel and interference
used WOPPER to get the numbers

P_{e^-}	P_{e^+}	factor (with 100% Pol.)	with 80% e^- , 60% e^+
0	0	1	1
+1	0	0.01	0.21
-1	0	1.98	1.73
+1	-1	0.03	0.10
-1	+1	3.96	2.85

Single-W production can only be 'switched off' for $e_R^- e_L^+$ (need both beams polarised for this).

$$e^+e^- \rightarrow ZZ:$$

P_{e^-}	P_{e^+}	factor (with 100% Pol.)	with 80% e^- , 60% e^+
0	0	1	1
+1	0	0.89	0.75
-1	0	1.31	1.25
+1	-1	1.37	1.05
-1	+1	2.62	1.91