

Status report

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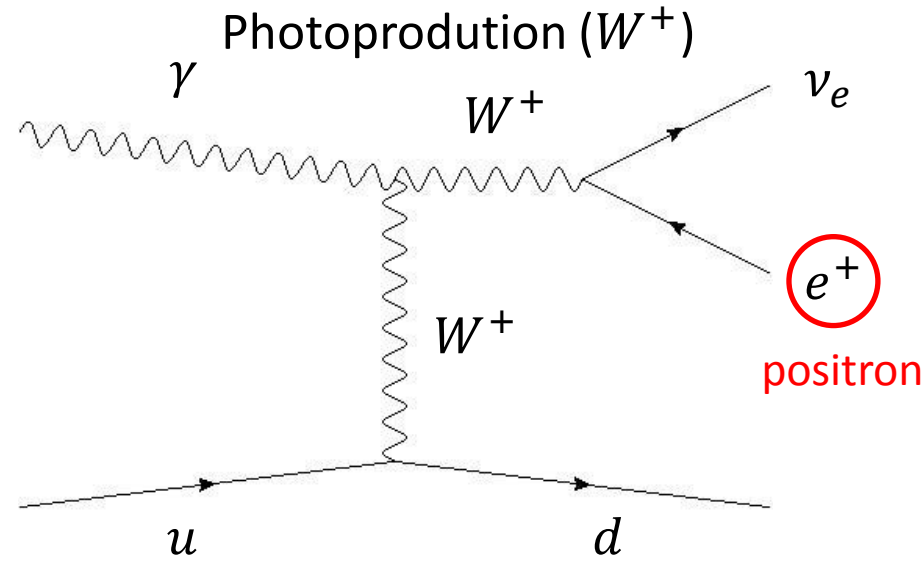
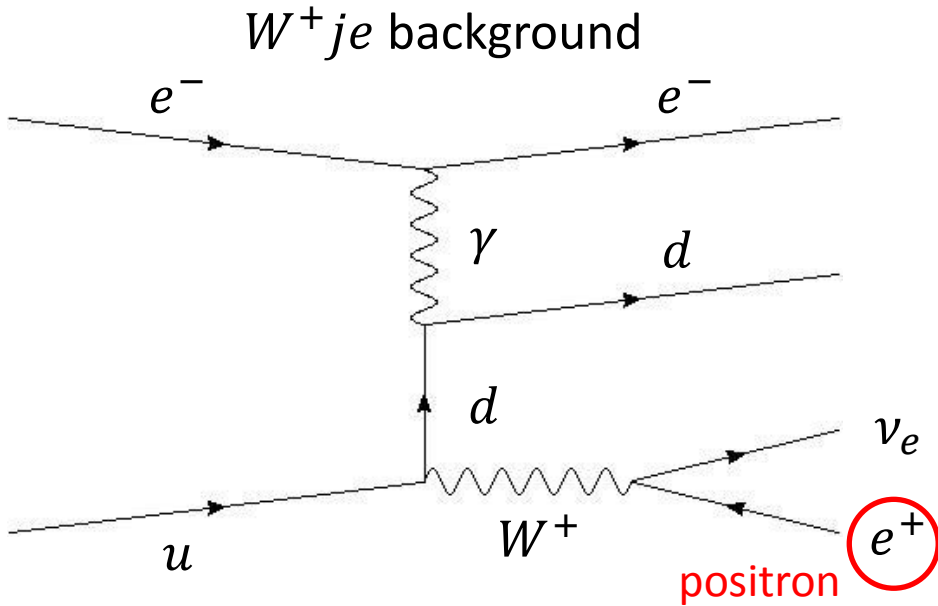
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- Charge cut ($Q_e = -1$)

Charge cut ($Q_e = -1$)

We imposed the charge cut ($Q_e = -1$) to reduce a background including a positron in the final state.



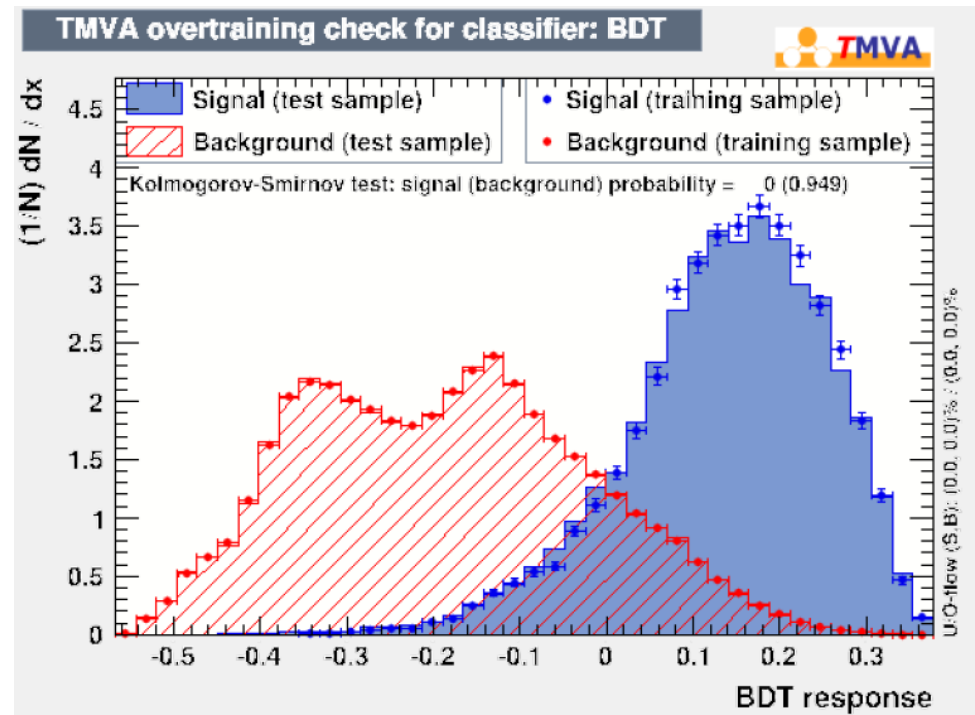
Event	After all cuts
W^+je	737 \rightarrow 737
Photon+	36 \rightarrow 0

- W^+je background can't be removed (there isn't a positron from W^+ in the final state).
- Photon+ can be removed.
- $\text{Br}(h \rightarrow \cancel{E}_T) \sim 5.92\%$ at 2σ level.

Cut optimization (MVA)

We included the charge cut ($Q_e = -1$) in the preselection and analyzed the signal and the backgrounds by MVA (BDT).

Score >	N_s	N_B	Br[%]
0	6737	75243	8.14
0.05	6109	46242	7.04
0.1	5068	24116	6.13
0.15	3783	10856	5.51
0.2	2432	4092	5.26
0.25	1243	1262	5.72
0.3	382	242	8.14
0.35	35	4	11.4



$$Z = \frac{N_s}{\sqrt{N_b}} = \frac{2432 \times \text{Br}(h \rightarrow \cancel{E}_T)}{\sqrt{4092}} \quad \text{In the case of } 2\sigma \quad \Rightarrow \quad \text{Br}(h \rightarrow \cancel{E}_T) \sim 5.26\%$$

※Br($h \rightarrow \cancel{E}_T$) ~ 5.92% (cut-based)

Summary

- When we considered the charge cut ($Q_e = -1$), $\text{Br}(h \rightarrow \cancel{E}_T) = 5.92\%$ (cut based) and $\text{Br}(h \rightarrow \cancel{E}_T) = 5.26\%$ (MVA) at 2σ level.