Fast Matrix Element recent tests

Miquéias M. Almeida

13 de julho de 2015

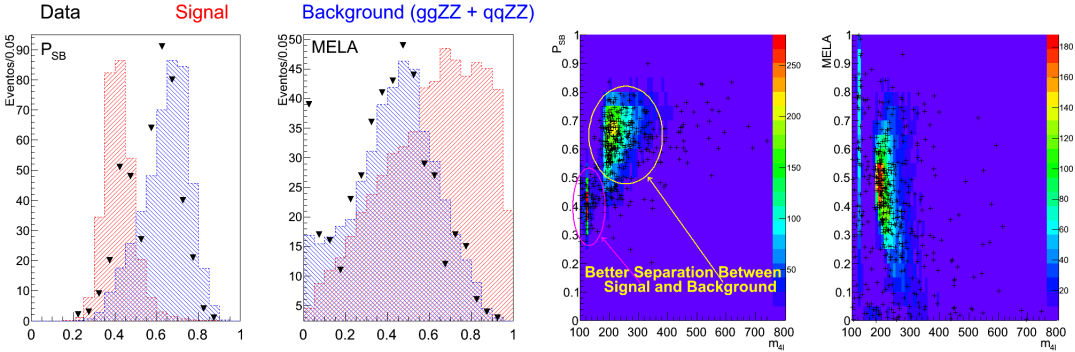
We Defined the Following Discriminant

$$P_{SB} = \frac{DR_{min}^{Sig}}{DR_{min}^{Sig} + DR_{min}^{Bkg}}$$

- By definition, P_{SB} gets values only between [0,1]:
  - If $DR_{min}^{Sig} = 0$ and $DR_{min}^{Bkg} \neq 0$, $P_{SB} = 0$;
  - If $DR_{min}^{Bkg} = 0$ and $DR_{min}^{Sig} \neq 0$, $P_{SB} = 1$;
- Usually the discriminat have a purity of 84-95%;
- Because the definition, the ideal cut is $P_{SB} = 0.5$:
  - If testing event is signal $DR_{min}^{Sig} < DR_{min}^{Bkg}$, so the denominator in P_{SB} is less than $2DR_{min}^{Sig}$. Then, $P_{SB} < 0.5$;
  - In the inverse way, if testing event is background the denominator is $< 2DR_{min}^{Sig}$. Then, $P_{SB} > 0.5$;

Comparing P_{SB} with MELA

- P_{SB} separates most clearly signal and background (both 1D and 2D cases);



- P_{SB} have more eficiency in reject background without substantial loss of signal;