Binning for mass

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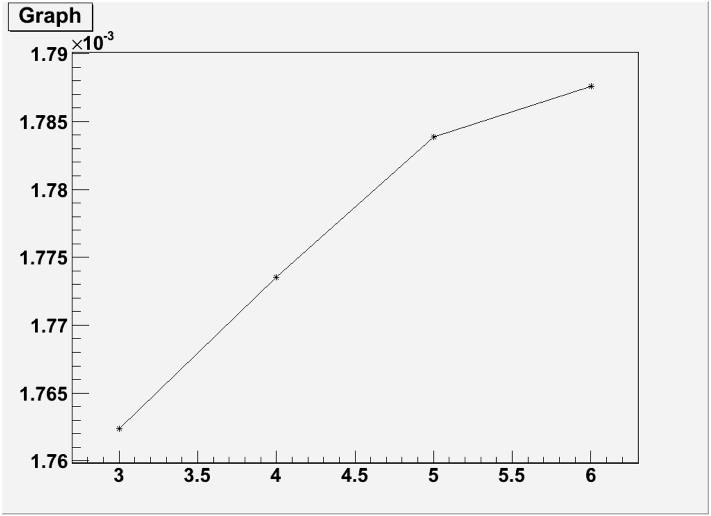
Some info

Assumptions

- Tau Mass is gauss with mean and witdth form the note.
- Backgound is flat.

We have no way to estimate the backgound without biasing. Also backgound changes from bin to bin which is also problematic. It's impossible to run optimisation in each bin(low statisics in high BDTs). Flat background is the only assumtion that comes to my mind.

LQ



Comments

- Moving from 3 $\rightarrow$ 6 bins improves result by $< 2\%$.
- Optimum binning: 1763.4, 1767.4, 1772.4, 1784.4, 1789.4, 1793.4

Conclusions

- Not much improvement in mass binning. The improvment is small becouse only signal is peaking. In BDT bck and signal is peaking in different places.
- I would not use more than 6 mass bins. We won't get much and the limit calculation script will run even slower.
- From current binning we acan improve 0.5%.
- There is not big need to change this binning. If we change something else we can also modify this.
- Results consistent with $Bs \to \mu\mu$.