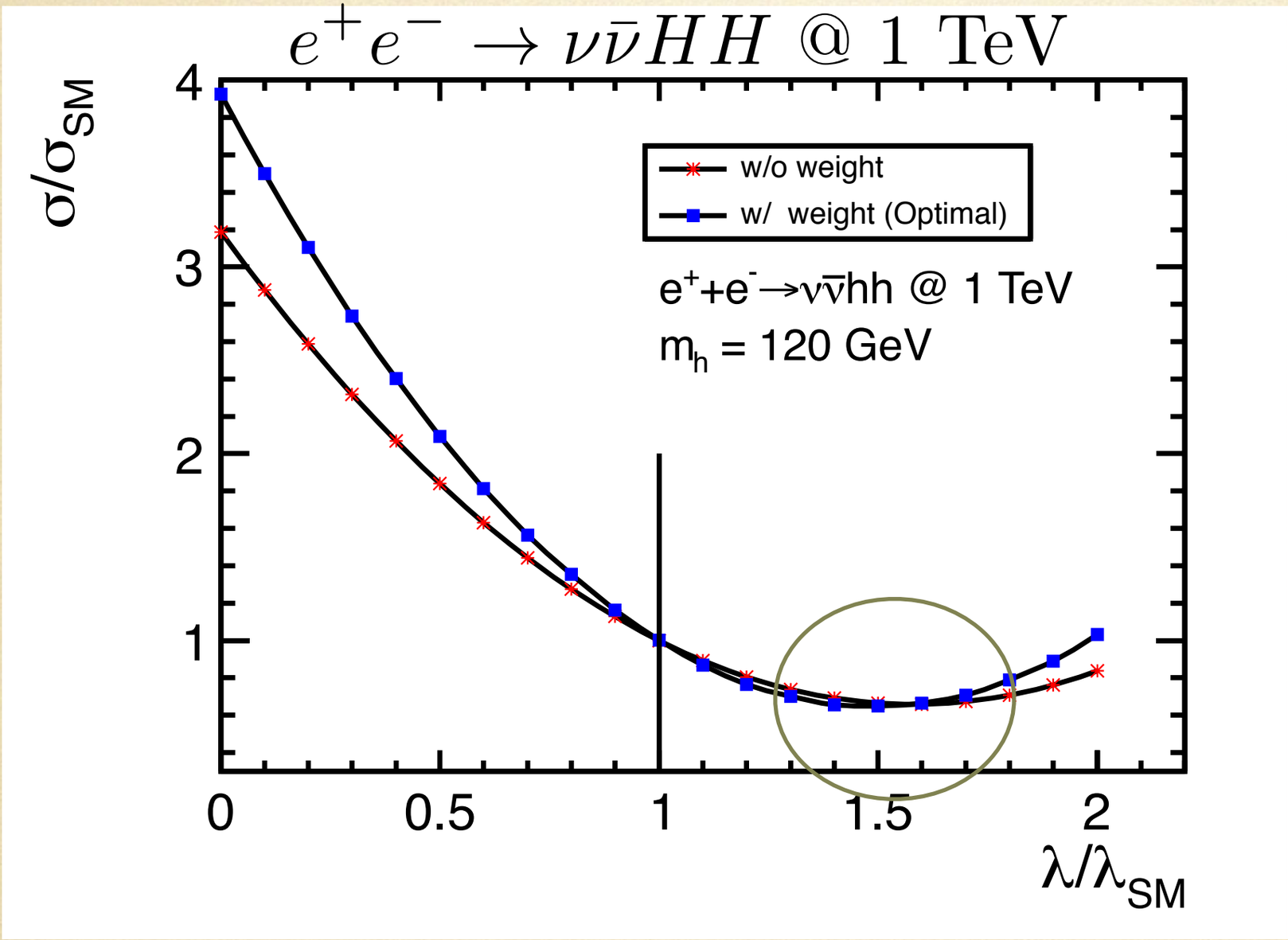
sensitivity of λ_{HHH} in $\nu\nu HH$ @ 1 TeV

Junping Tian (KEK)

Asian Physics & Software Meeting, Feb. 20, 2015

recent poster at HPNP 2015: http://jodo.sci.u-toyama.ac.jp/theory/HPNP2015/Slides/HPNP2015Poster1/Tian_20150212.pdf

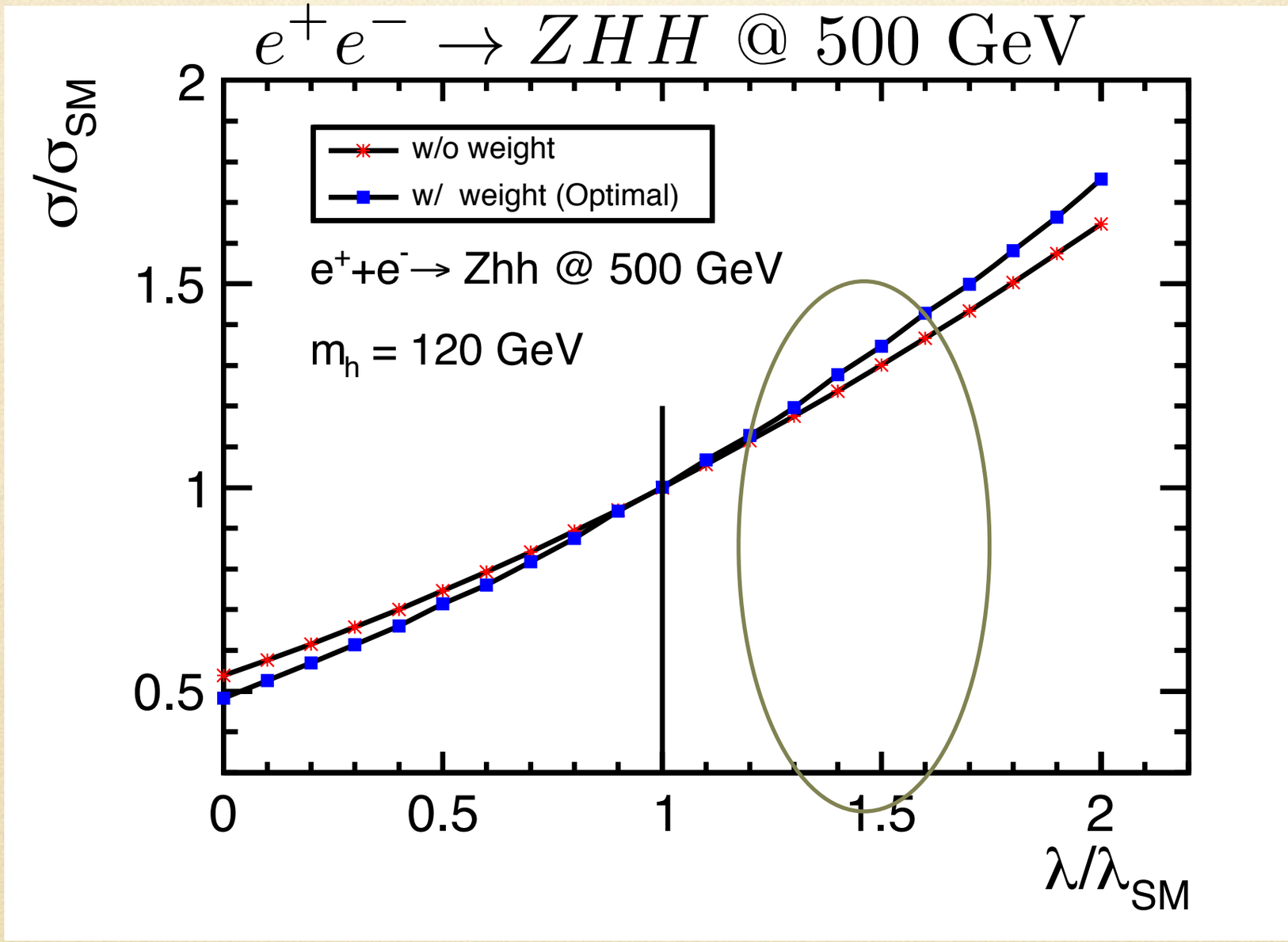
sensitivity of Higgs self-coupling



question:
what happens if λ is ~ 1.5?
It seems sensitivity of coupling to cross section becomes minimum

$$\frac{\Delta\lambda}{\lambda} = 0.85\frac{\Delta\sigma}{\sigma} \qquad \frac{\Delta\lambda}{\lambda} = 0.69\frac{\Delta\sigma_w}{\sigma_w} = 0.76\frac{\Delta\sigma}{\sigma}$$

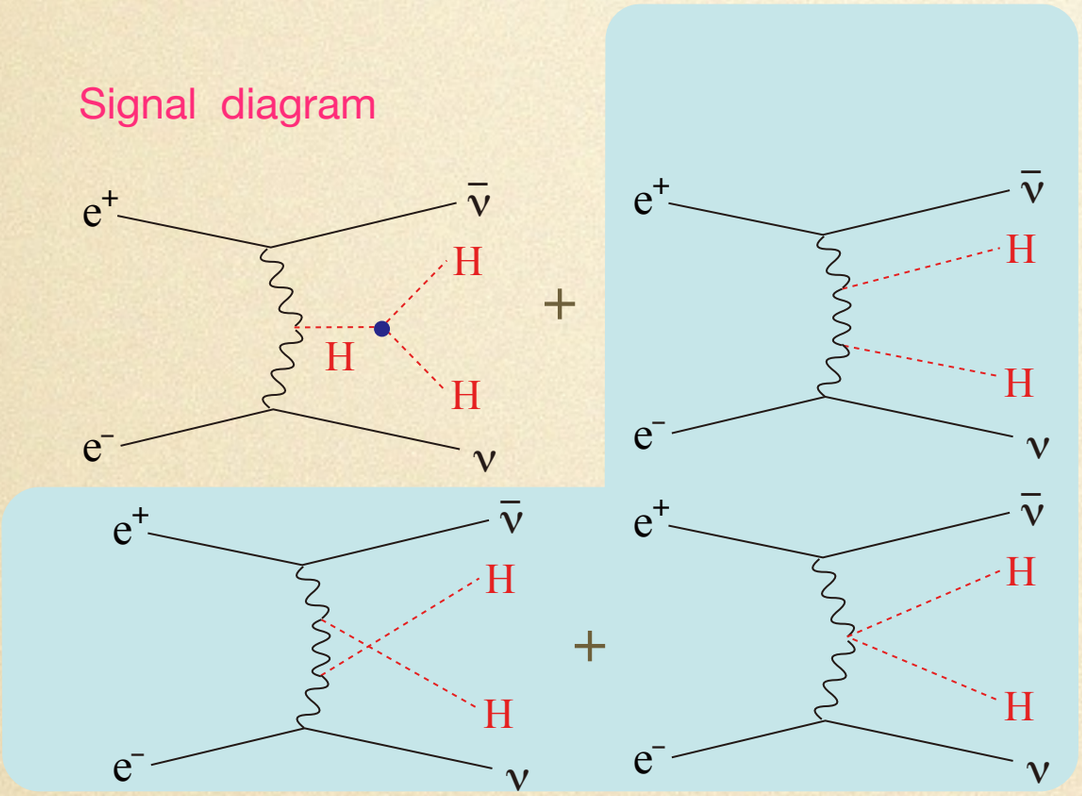
one easy answer is using ZHH:
larger λ, better measurement and sensitivity



what can be improved for ννHH, if λ~1.5

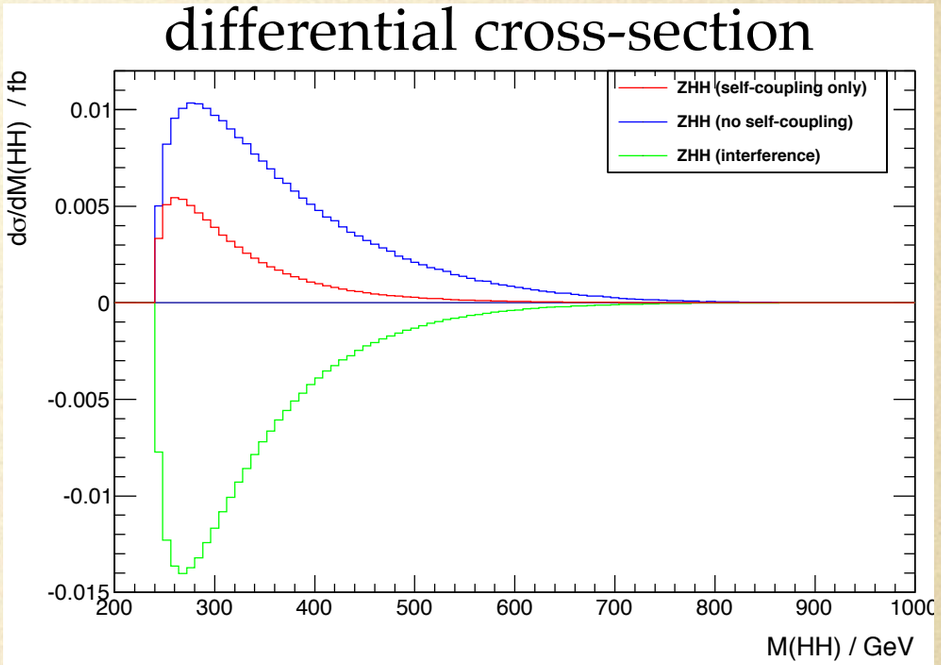
$$e^+e^- \to \nu\bar{\nu}HH \text{ @ 1 TeV}$$

Signal diagram

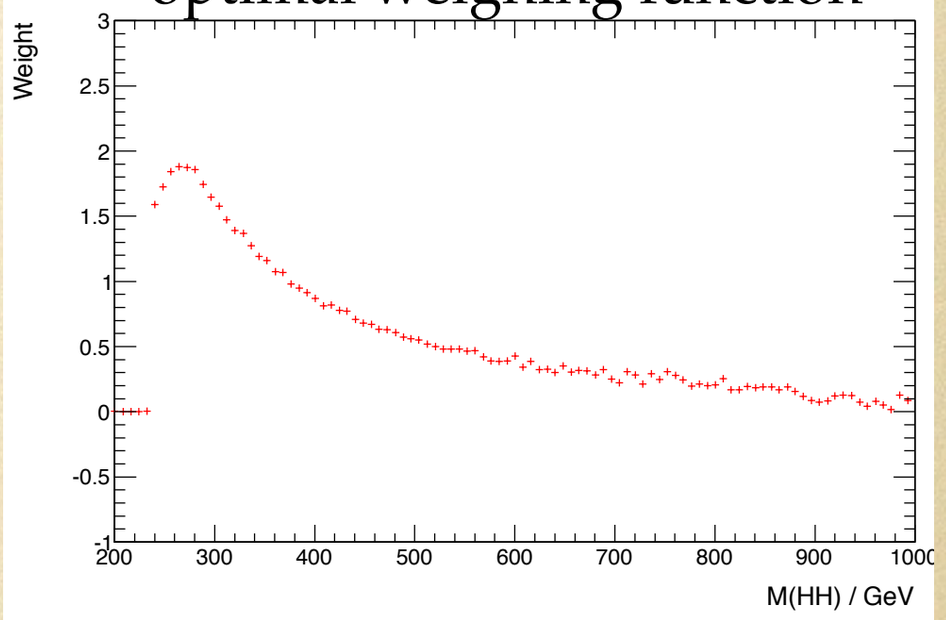


is dσ/dM(HH) the most sensitive one for weighting?

differential cross-section



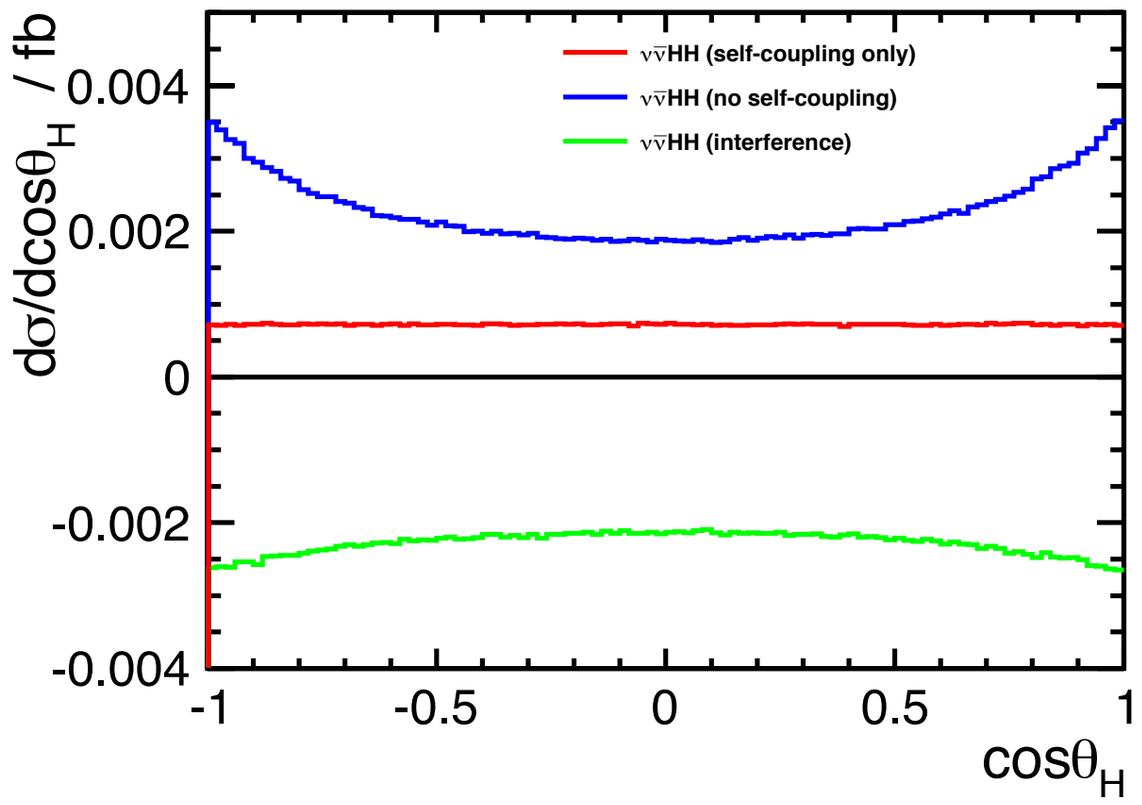
optimal weighing function



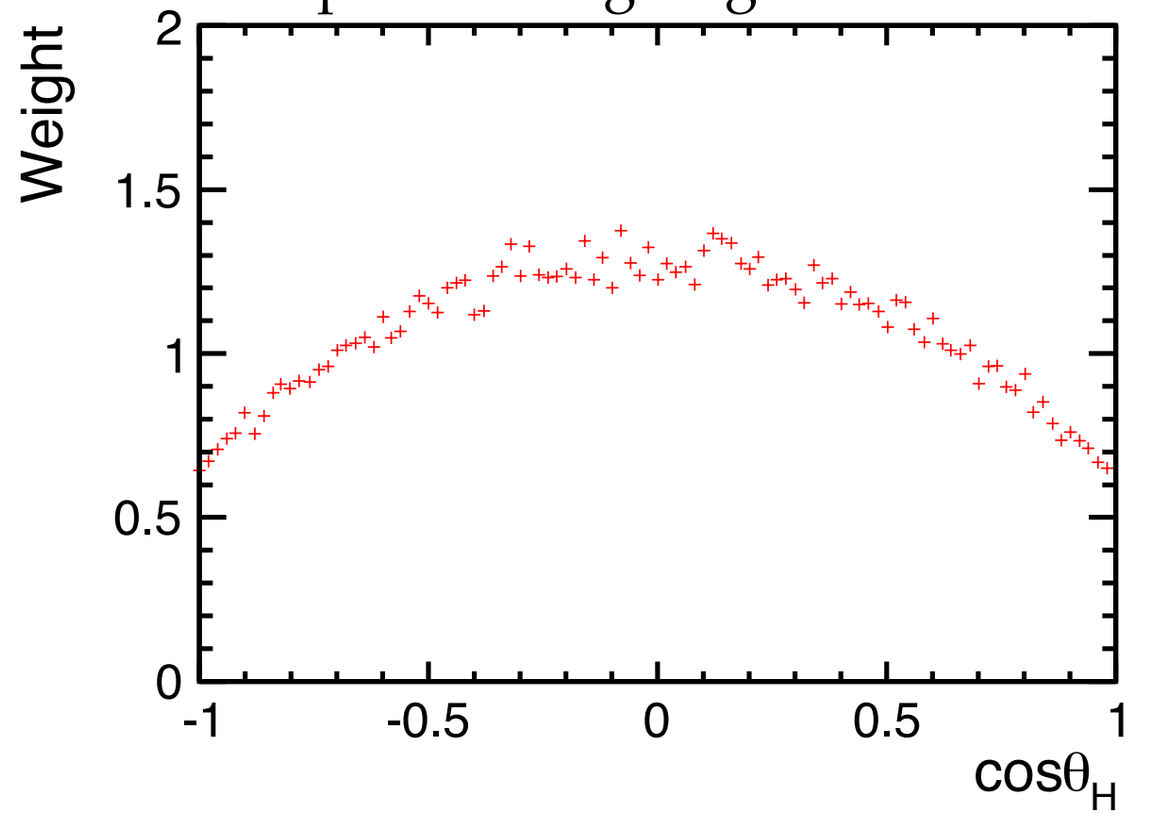
what can be improved for ννHH, if λ~1.5

$$e^+e^- \to \nu\bar{\nu}HH \text{ @ } 1 \text{ TeV}$$

differential cross-section



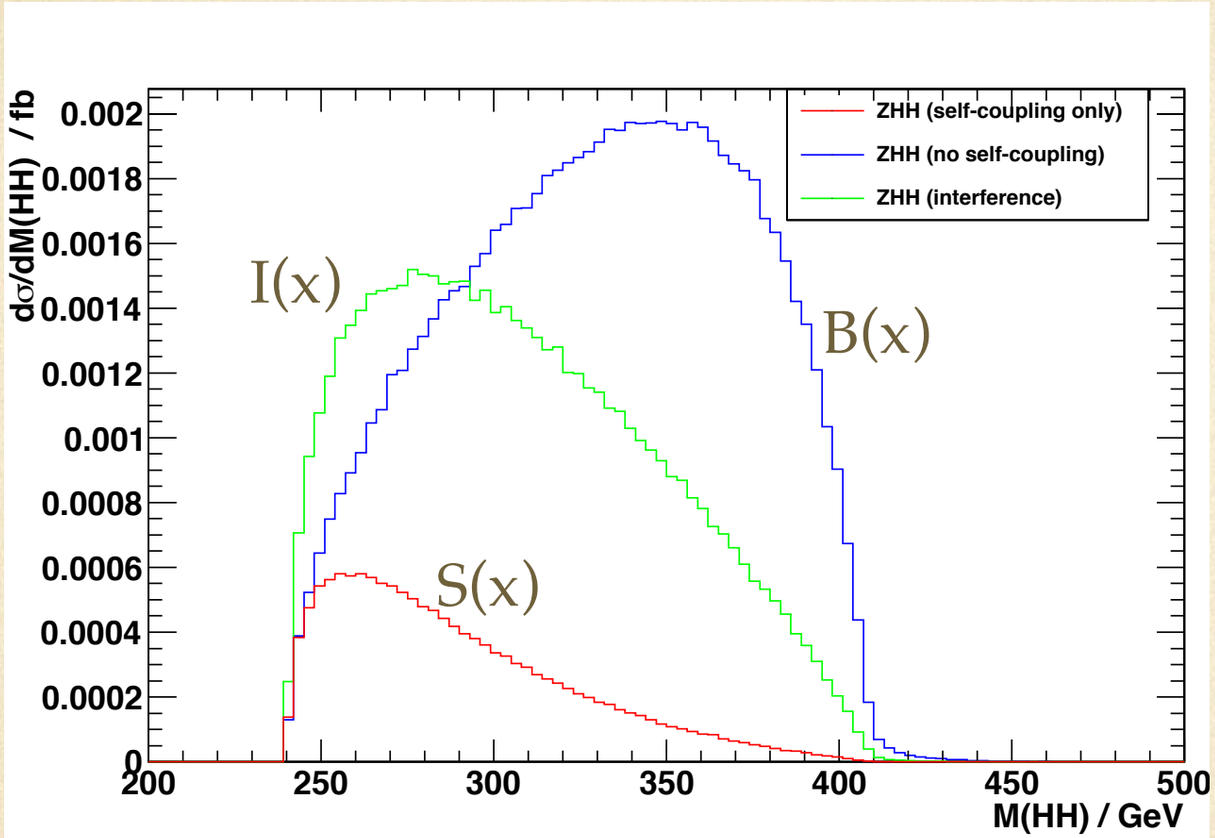
optimal weighing function

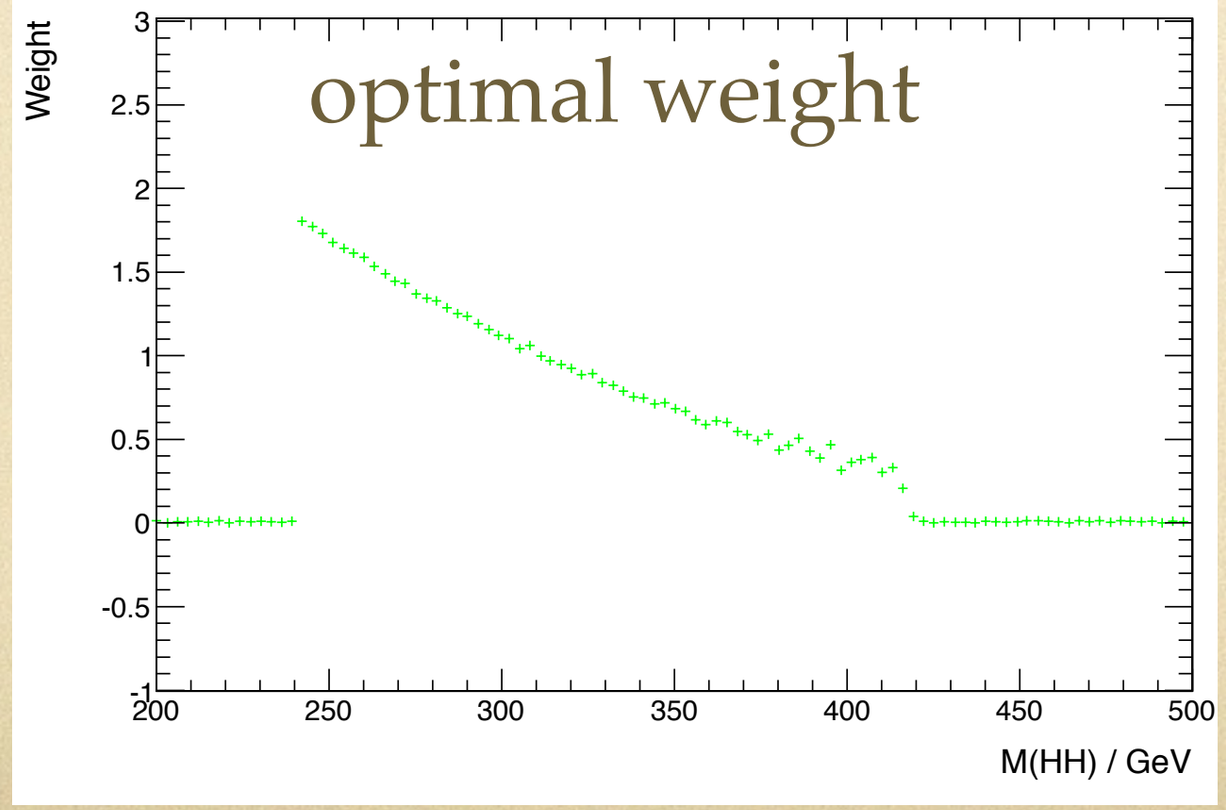


is $d\sigma/d\cos\theta_H$ going to be more sensitive or helpful if combined with $d\sigma/dM(HH)$?

backup

weight functions





idea of weighting

- different spectrum of M(HH) for ZHH from Higgs self-coupling and non-self-coupling