$H \rightarrow \mu\ \mu$ Update

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ILD Analysis & Software Meeting

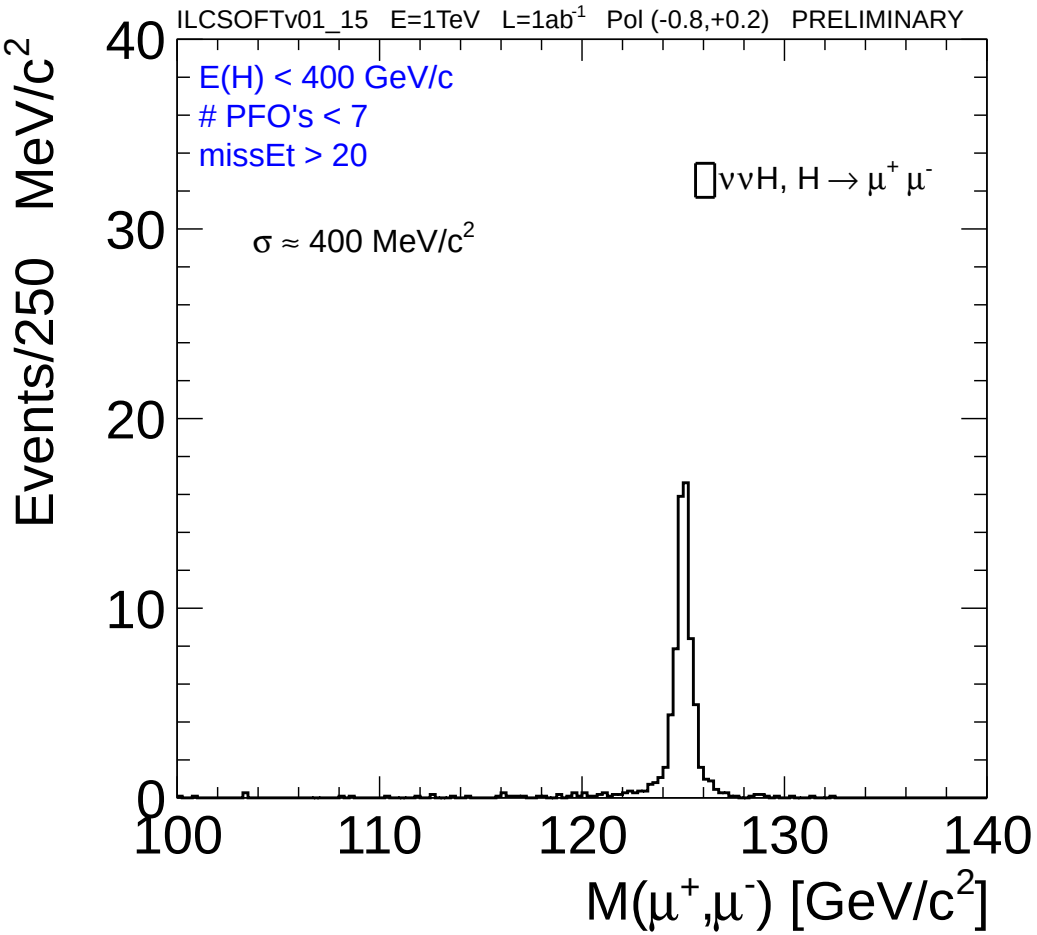
October 17th, 2012

Status

$H \rightarrow \mu\mu$

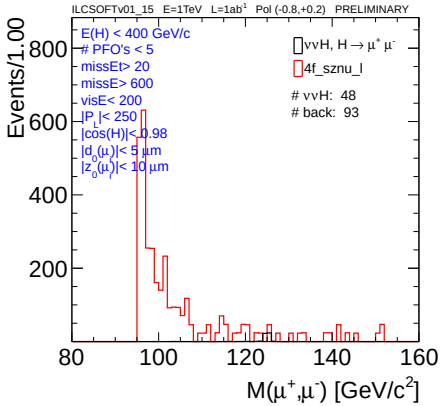
- E=1 TeV, L=1 ab^{-1}
- Expected only 91 events with beam polarization (e^{-1},e^{+1})=(-0.8,$+0.2$)
- Plots in these slides produced with data reconstructed with ILCSOFTv15_03
- Data reconstructed with ILCSOFTv_16 is available.

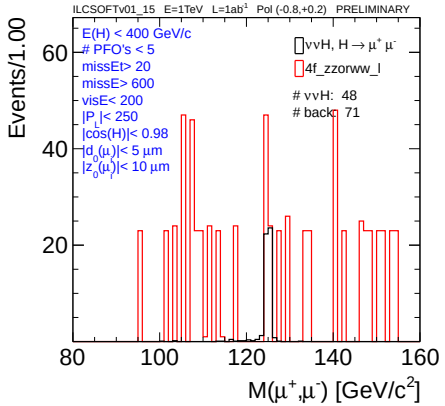
Mass H Window



- Resolution of the peak: $\sigma \approx 0.4$ GeV/c^2
- Defined Signal region as: (125-3*σ, 125+3*σ) (to be optimized).

Main Backgrounds

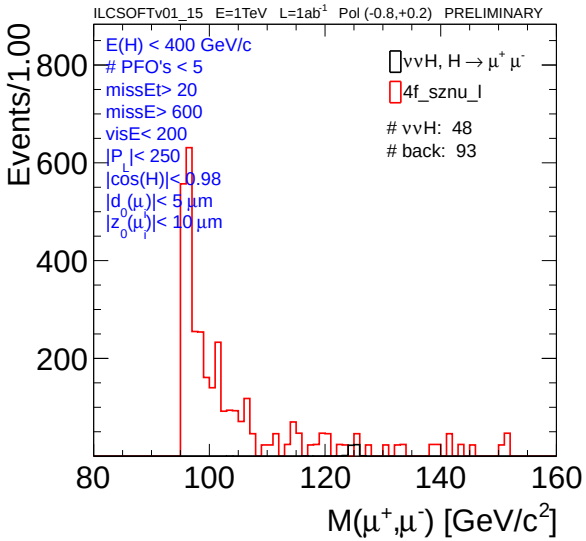


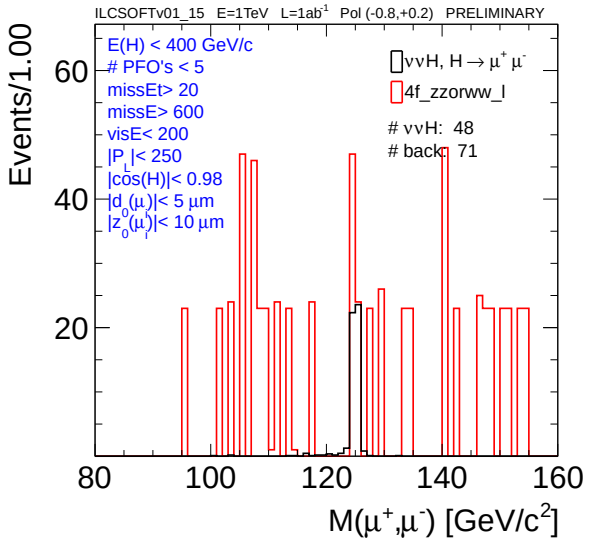


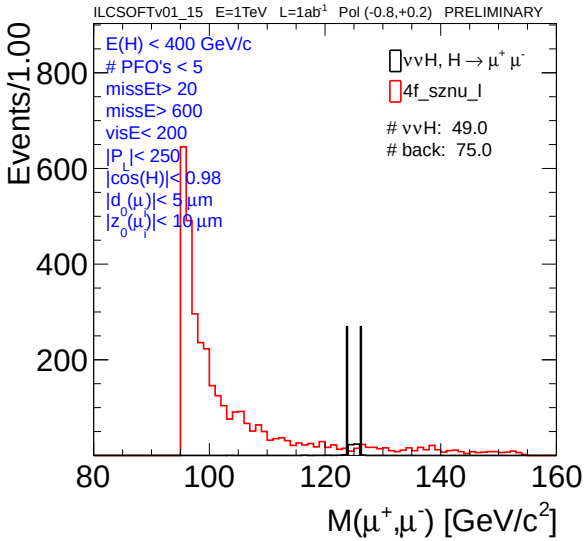
Main background contributions from :

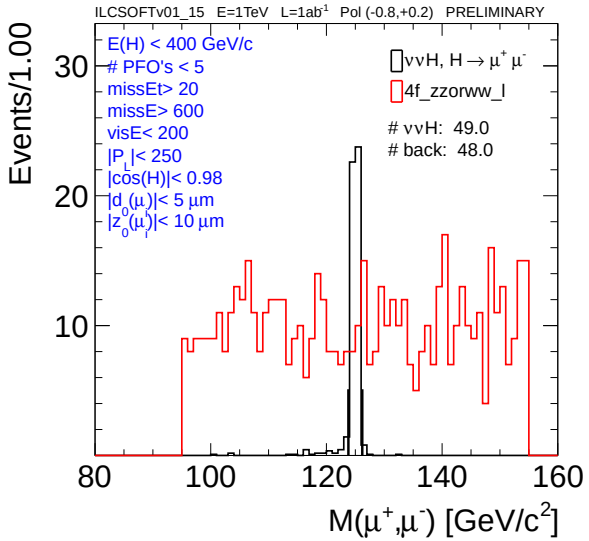
- *4f_sznu* leptonic and *4f_zzorww* leptonic
- Both with same final state as signal.
- These plots show not enough statistic for the background.
- Reconstructed all simulated events (1 ab^{-1}, next slide).

Main Backgrounds:Previous plots VS new ones

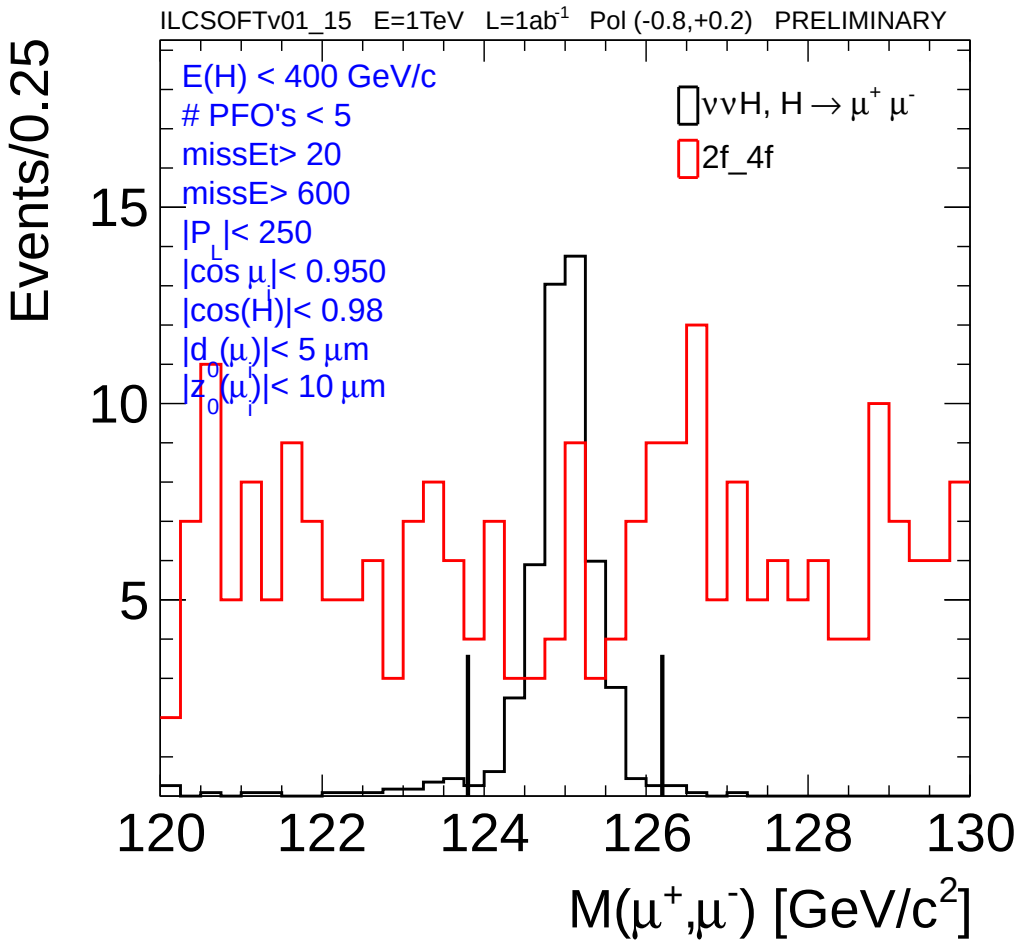






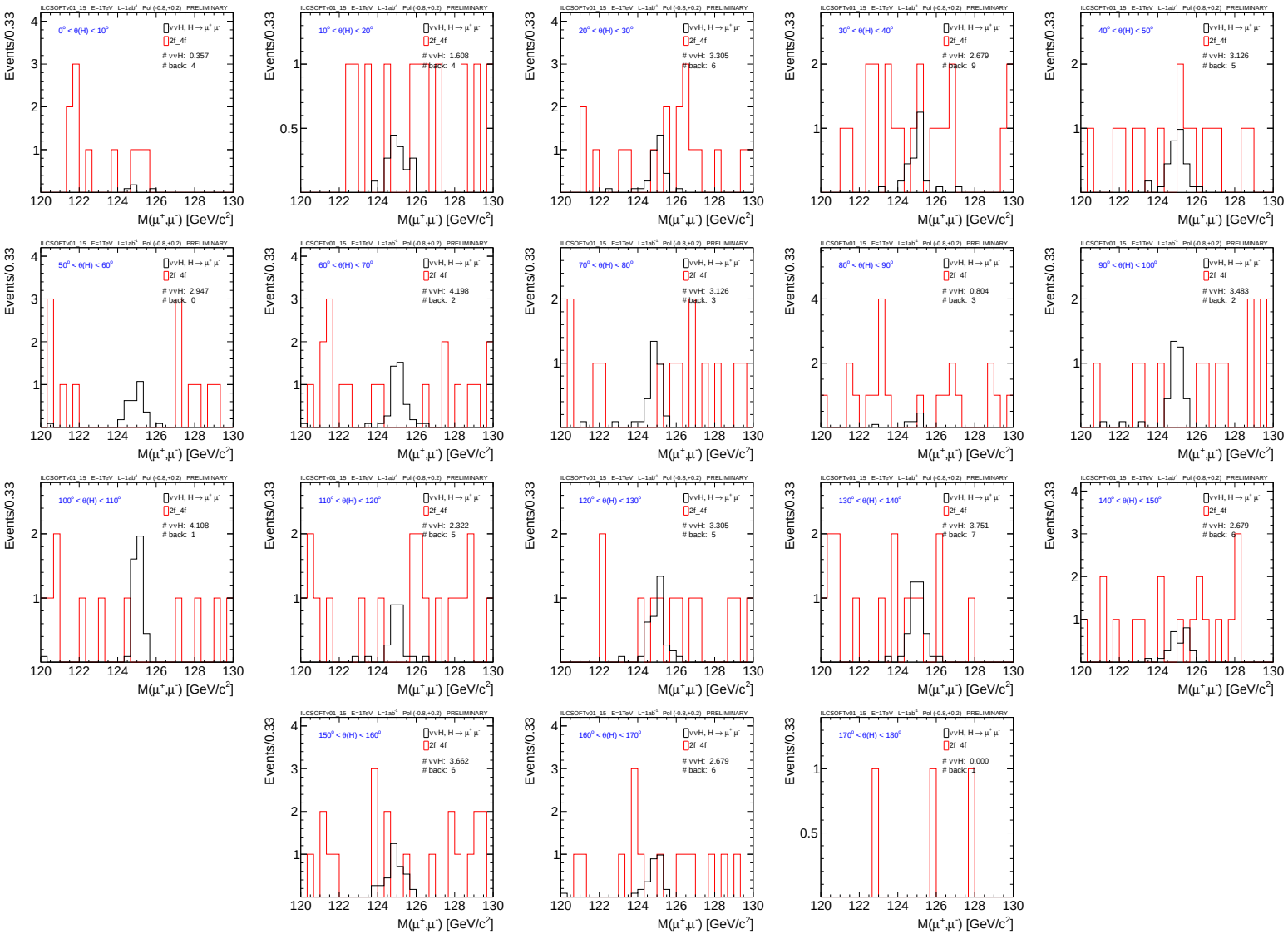


Status



- No optimized cuts

M(H) in θ(H) bins



- Same selection cuts as previous plots.

Summary

- Using 1 ab^{-1} samples for the main backgrounds (previously only a small fraction).
- Statistical significance $< 30\,\%$ with no optimized cuts.

- Reconstructed data with ILCSOFTv15_03 (samples with ILCSOFTv16 already available and they will be used).
- Talk in Arlington showing this channel (together with $H \to \gamma\gamma$ at 250 GeV, L=250 fb^{-1}).