ν_e at νPRISM

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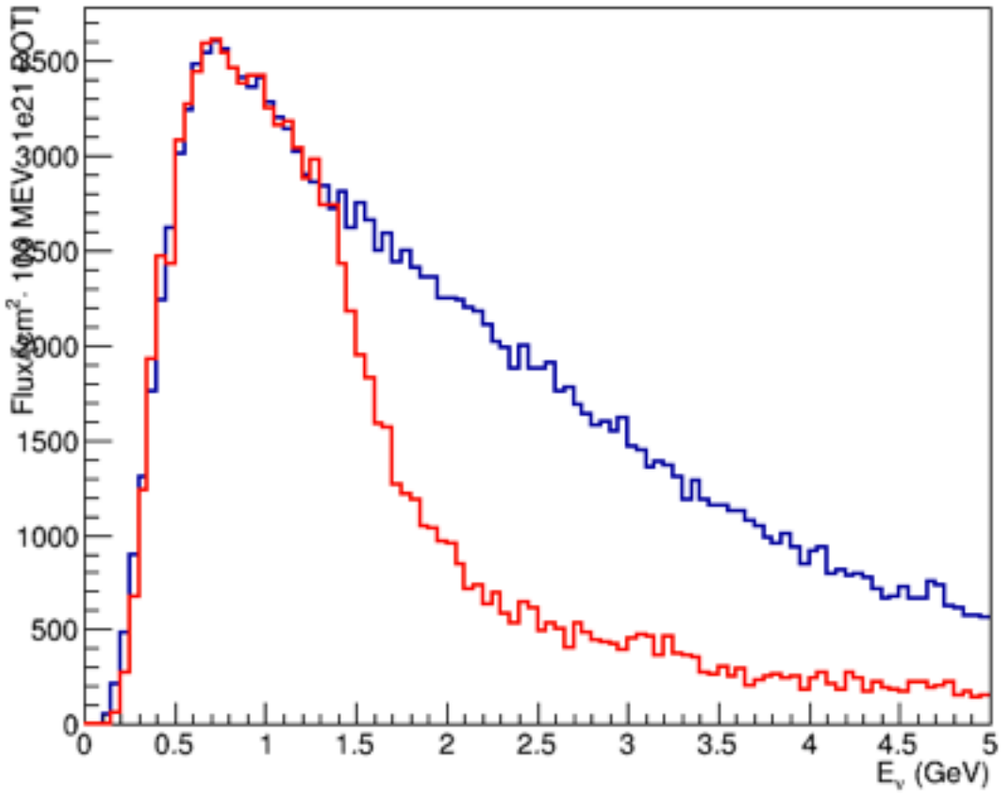
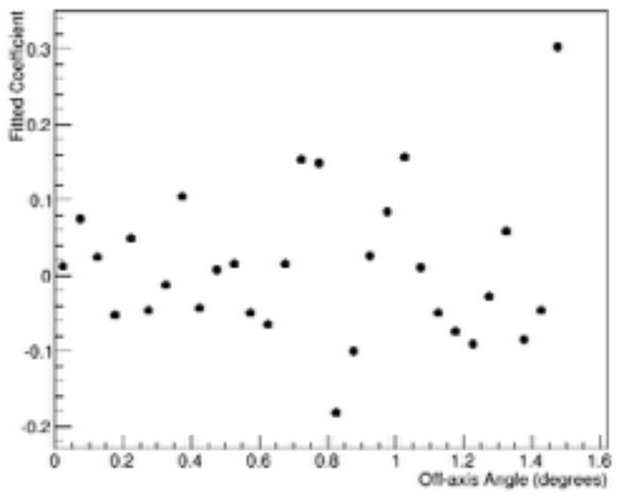
Appearance Needs

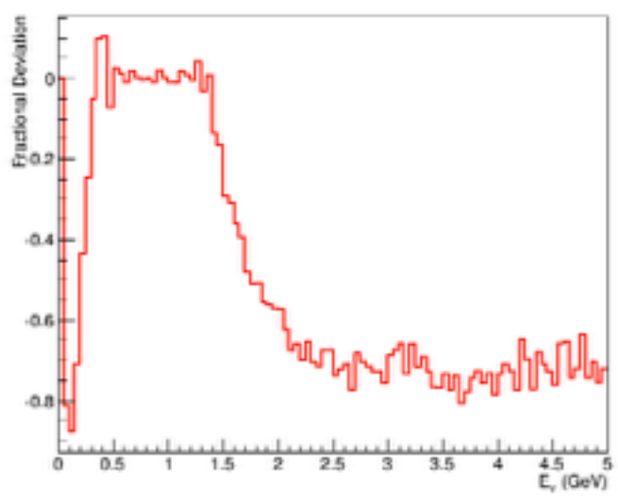
- Understand CC0π ν_e/ν_μ cross section ratios
- Model oscillation appearance signal and intrinsic background with νPRISM ν_μ

Coefficient Fits

- Fit νPRISM intrinsic ν_e peak with the νPRISM ν_μ
- Try with and without smoothing
- Hard to get peak quite right
- Falloff is strong at 1.25 GeV







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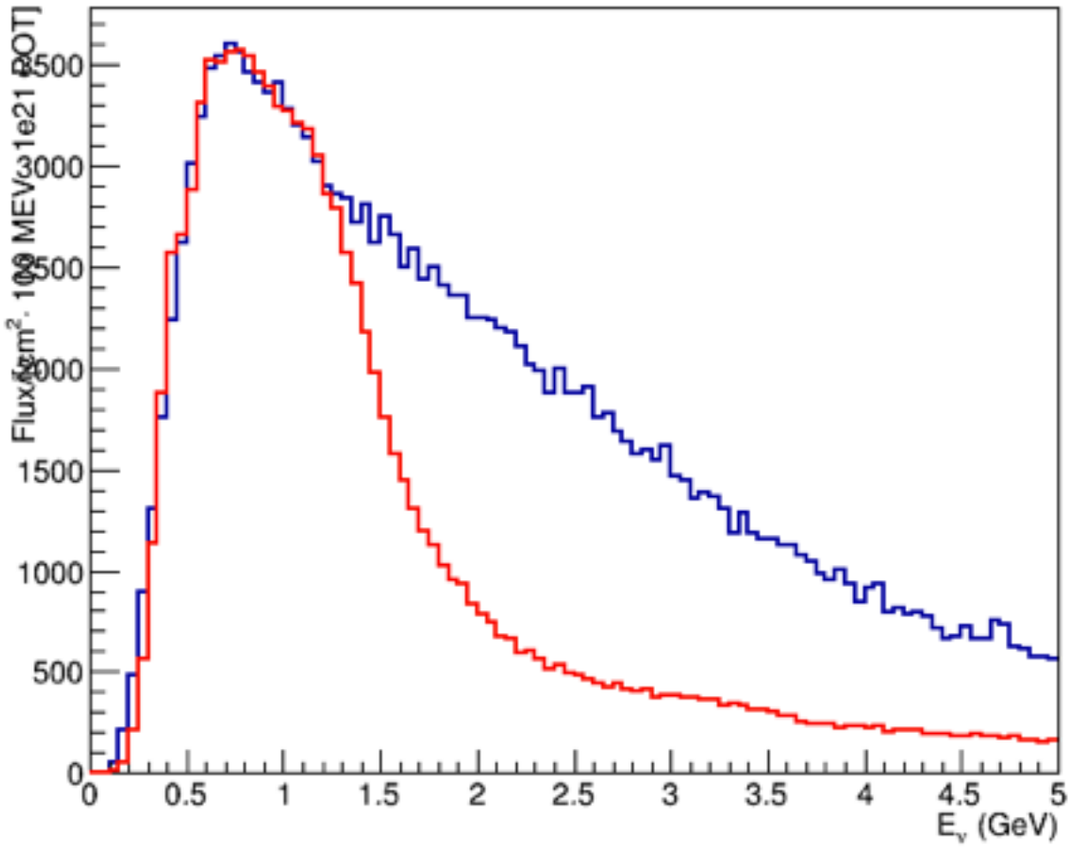
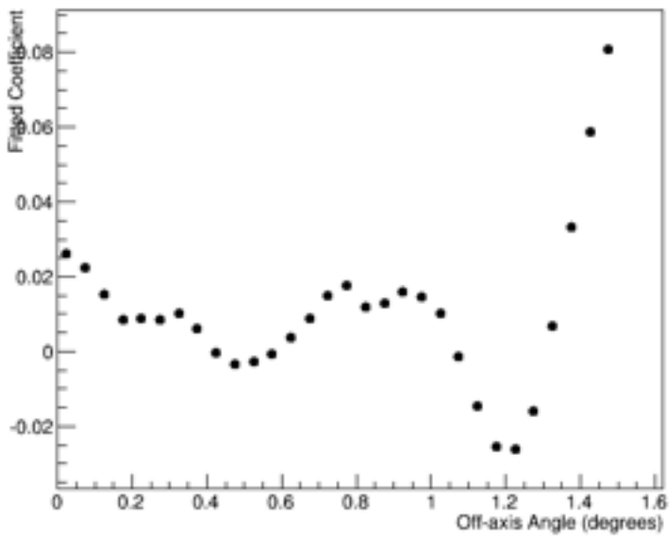
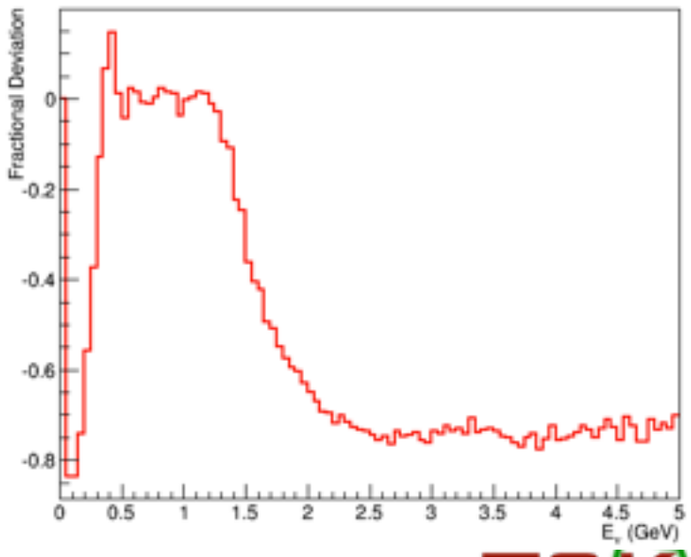
Coefficient Fits

- With stronger smoothing the fit gets less good
- Previous slide, smoothing of 0.1, this slide, 0.01







Method for ν_e/ν_μ

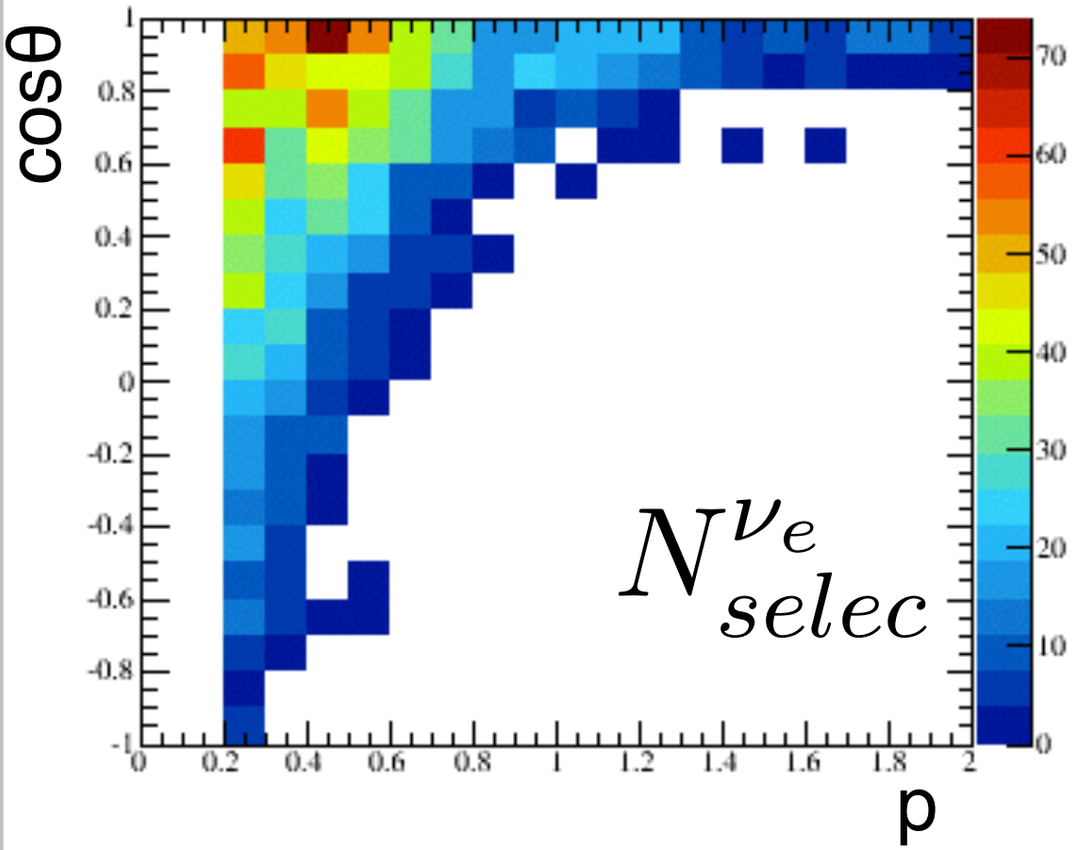
In each bin of p-θ:

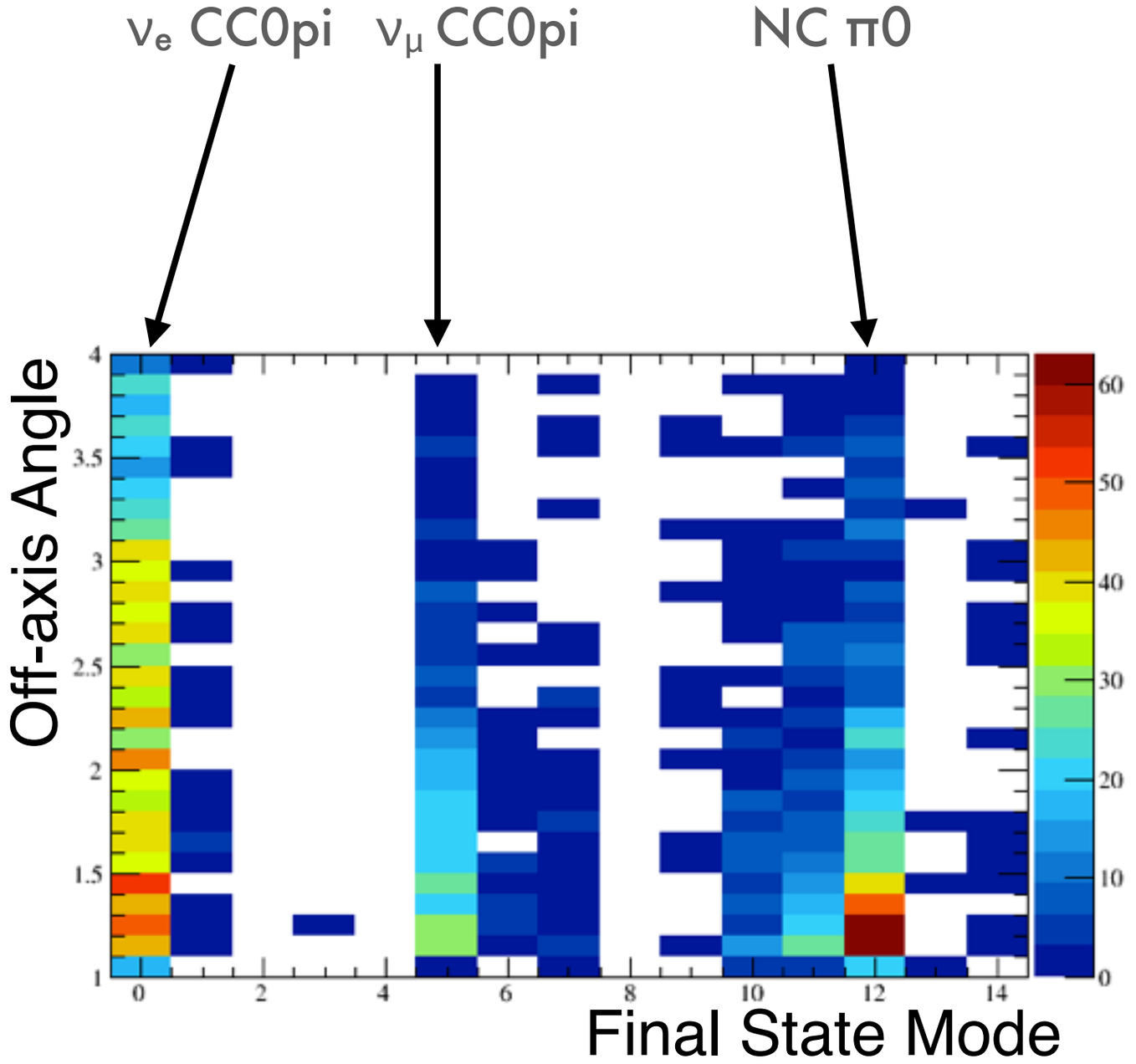
$$\frac{N^{\nu_e}_{selec} - B^{\nu_e}_{MC}}{\epsilon^{\nu_e}_{CC0\pi}} = \rho \sum_i C_i \frac{N^{\nu_\mu}_{selec} - B^{\nu_\mu}_{MC}}{\epsilon^{\nu_\mu}_{CC0\pi}}$$

Number of CC0π ν_e

Number of CC0π ν_μ

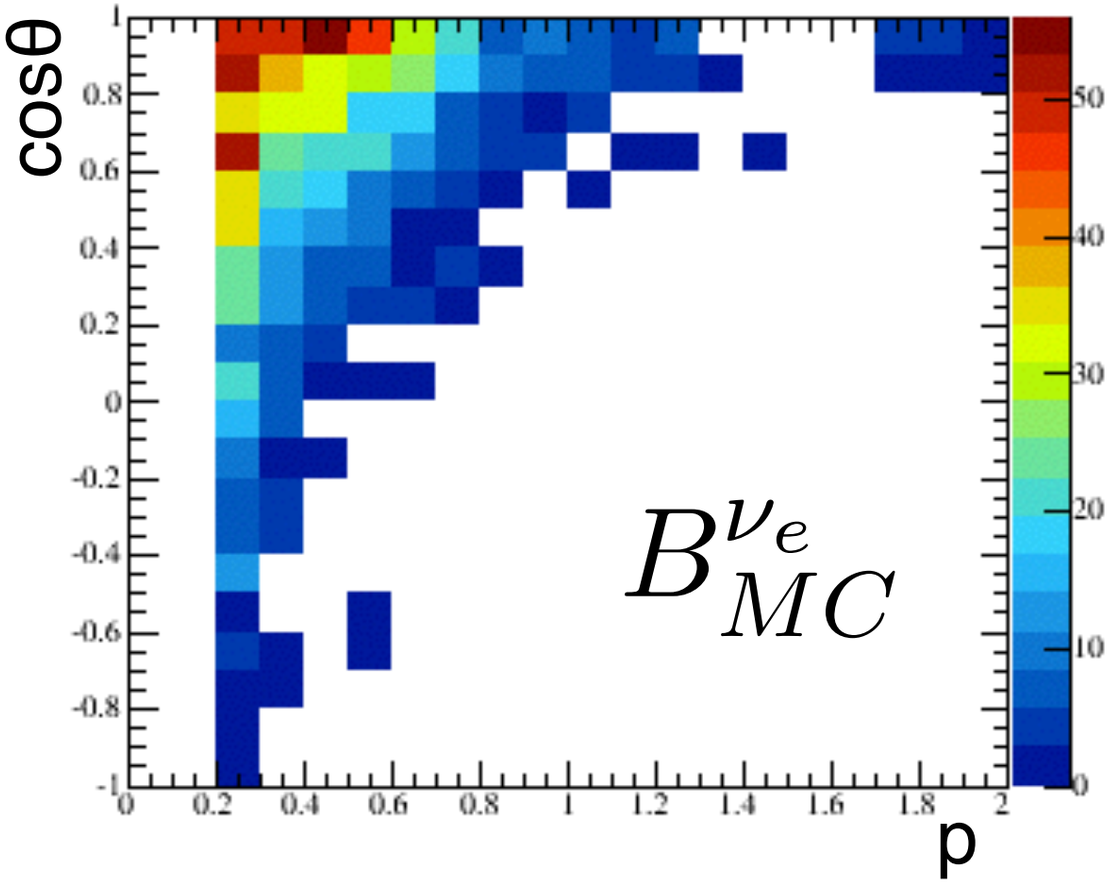
$N^{\nu e}$ Selected



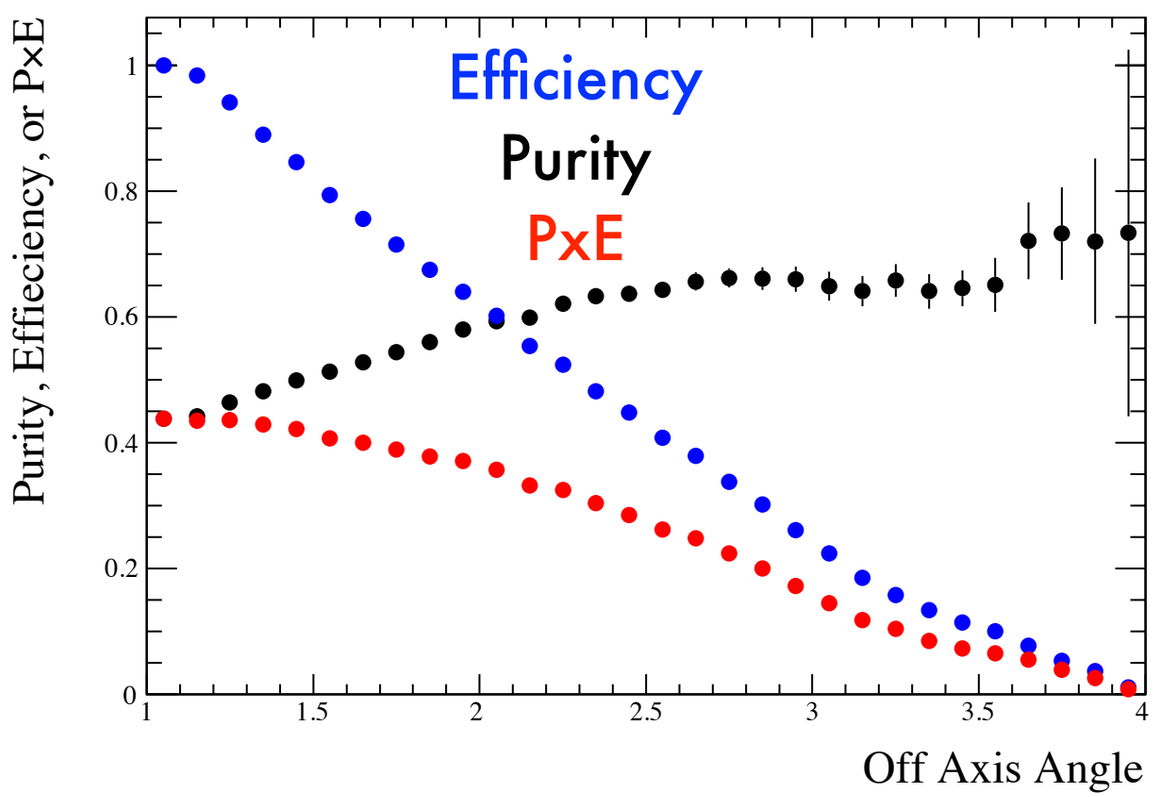


43% of selected ν_e are CC0π

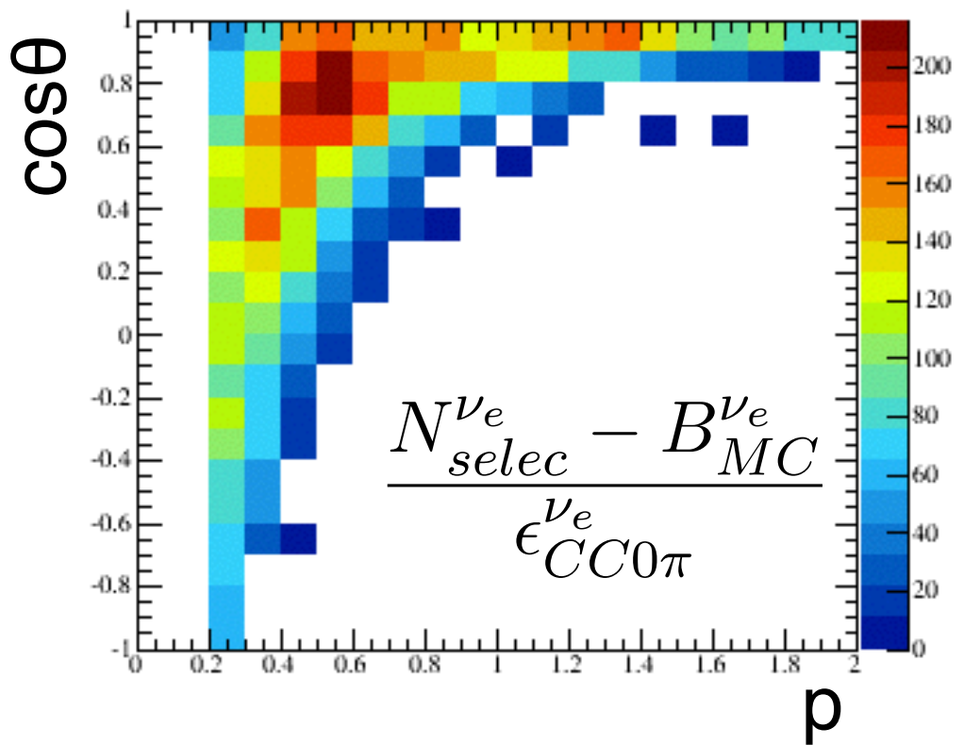
$N^{\nu e}$ Background



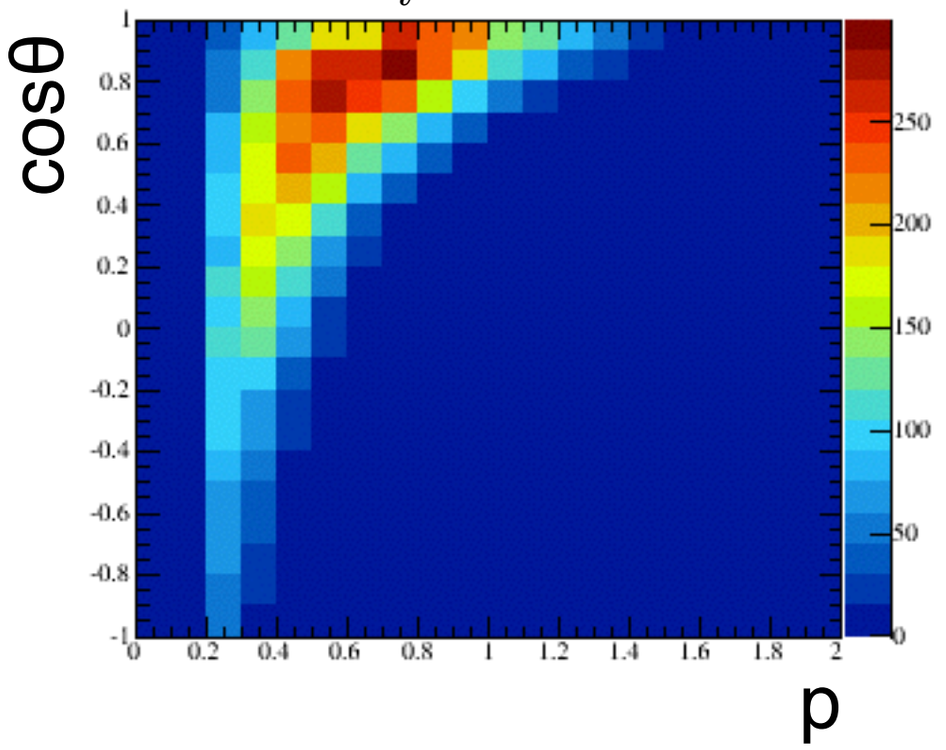
Using the whole detector seems best!

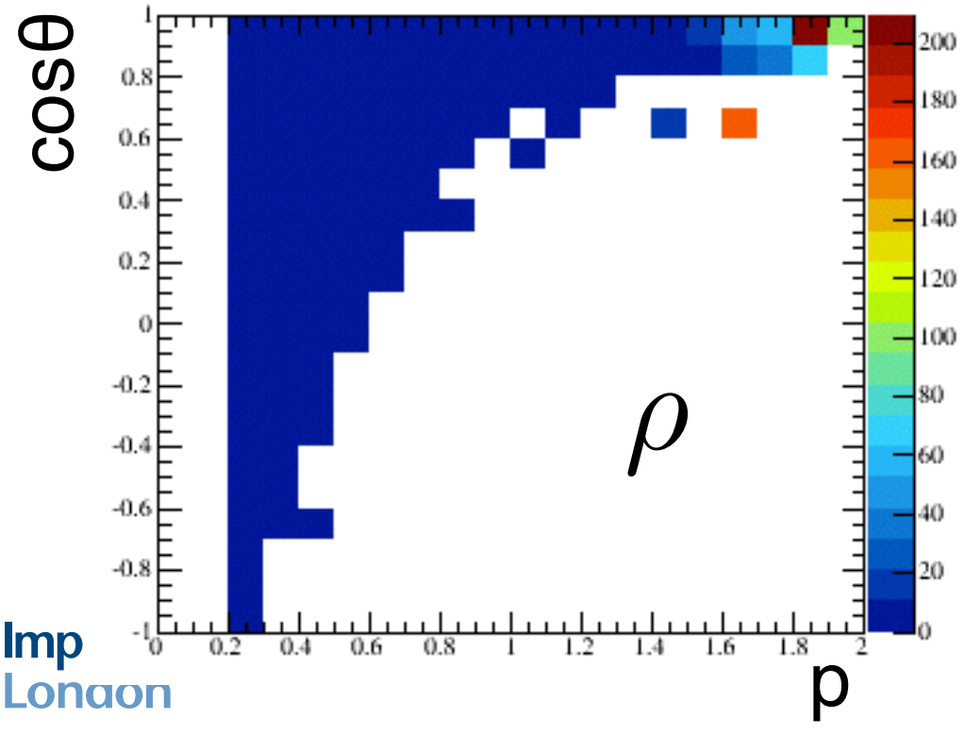


Ratio

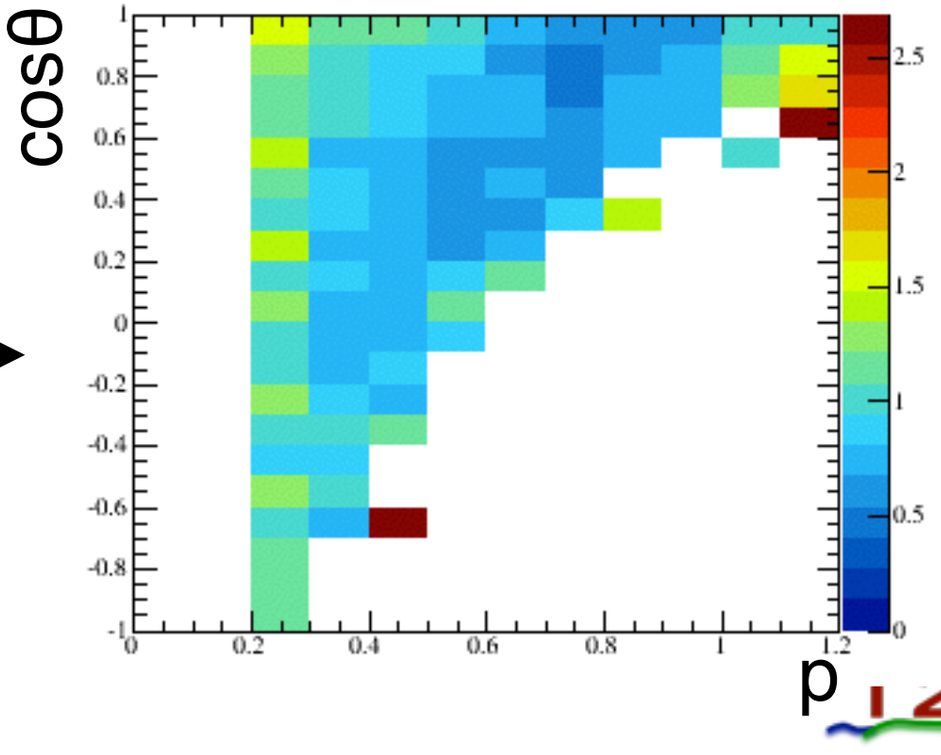


$$\sum_i C_i \frac{N^{\nu_\mu}_{selec} - B^{\nu_\mu}_{MC}}{\epsilon^{\nu_\mu}_{CC0\pi}}$$





Zoom



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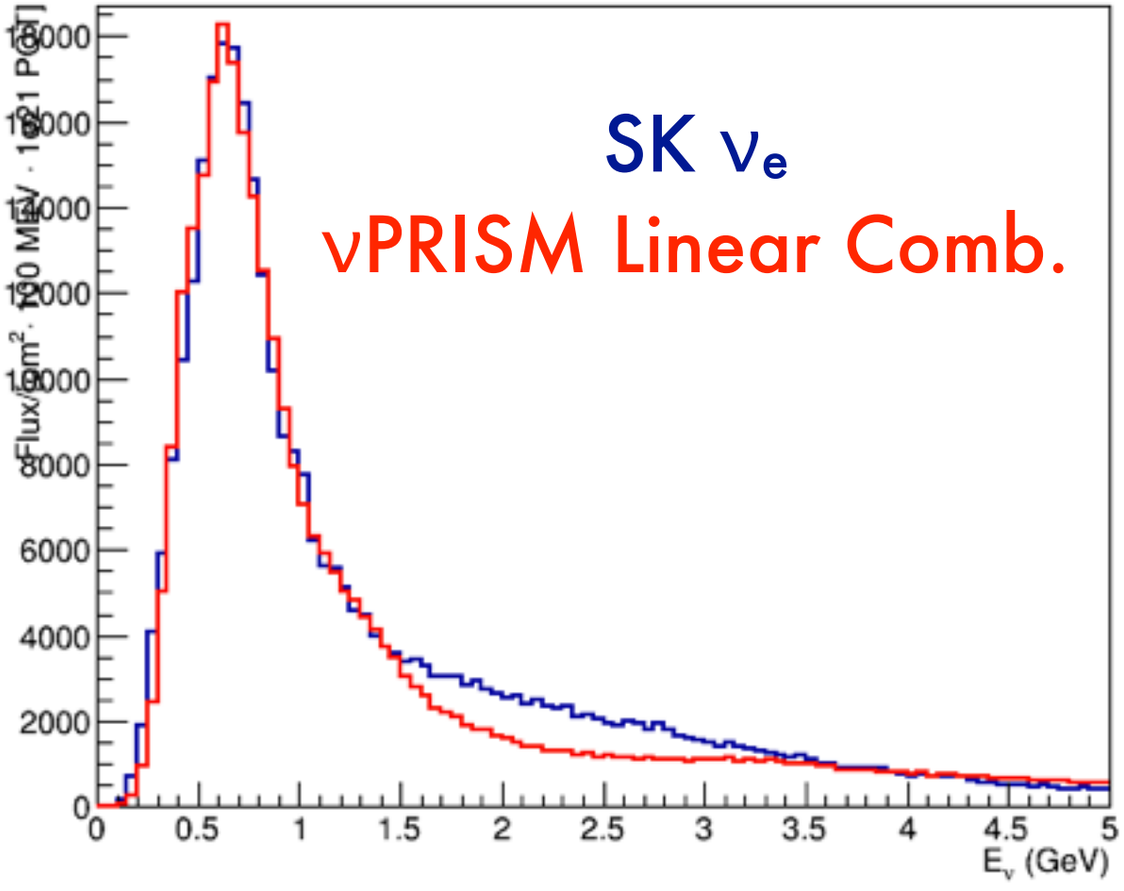
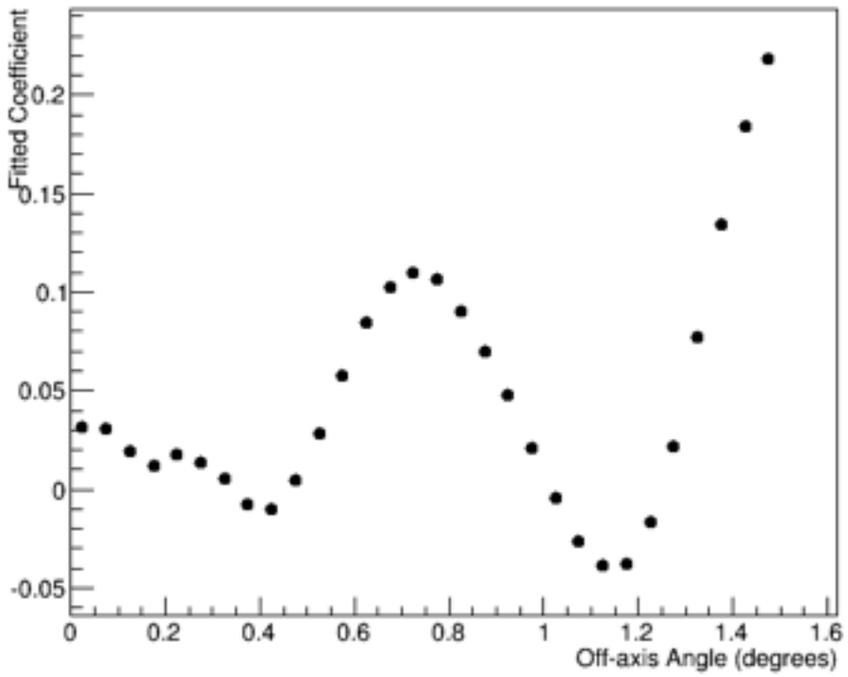
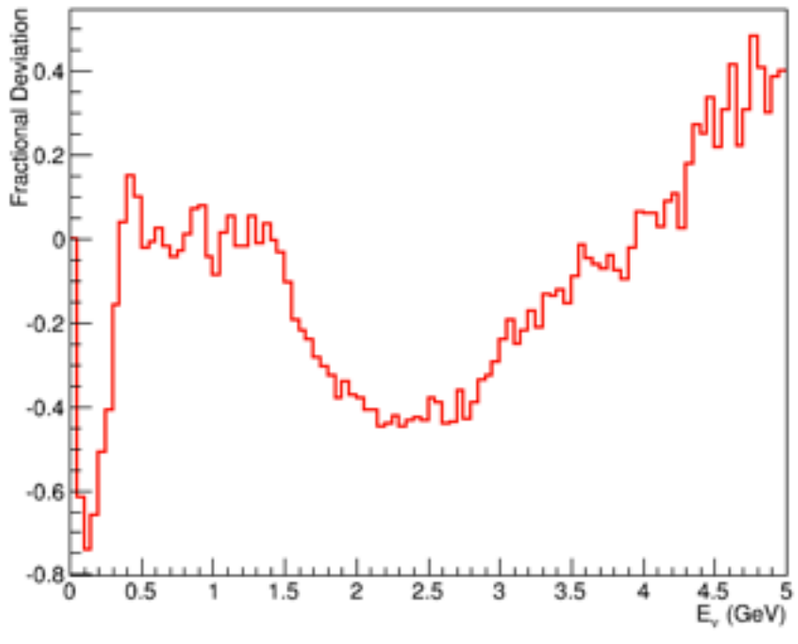
Flux Fits to SK ν_e







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Future Work

- Have investigated varying NC by 30%—seems ok, but I don't want to show plots because I haven't thoroughly checked
- Vary flux systematics, other cross section systematics
- Look at using NC sample for background removal
- Start looking at oscillation predictions