



University of Sussex



Comparison of sensitivity with resolution and hadronic energy fraction binning

Numu group, Sep. 2016

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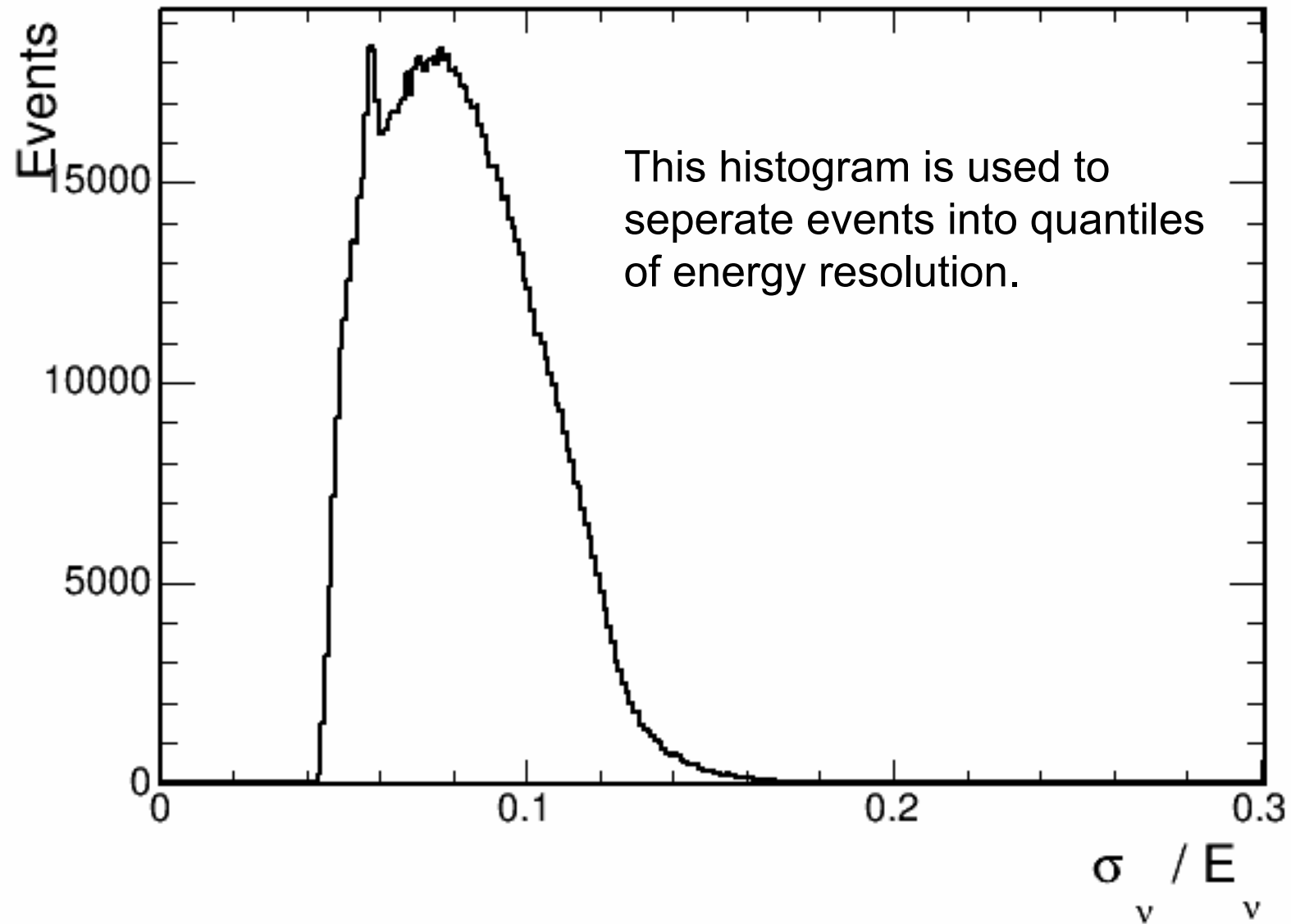
Version details

- Running in **development** to pick up recent changes
- Using FD decafs: </pnfs/nova/persistent/production/concat/R16-03-03-prod2reco.d/>

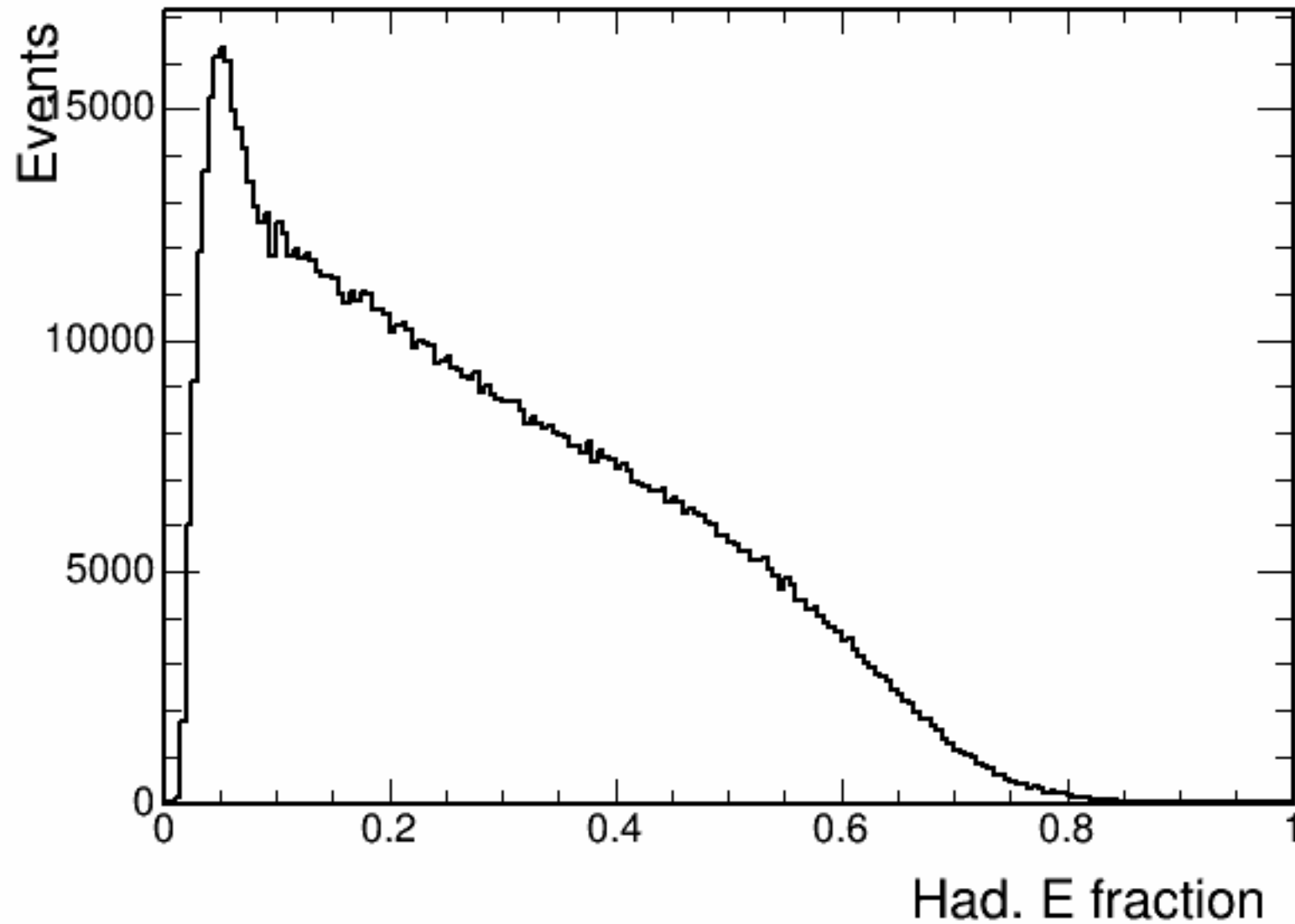
Outline

- This is a brief update on work shown last week (see DocDB: [16035](#))
- Plots of hadronic energy fraction and neutrino energy resolution
 - 1D hists
 - 2D hists vs. reco. neutrino energy
- Max. and non-max. mixing sensitivity contours

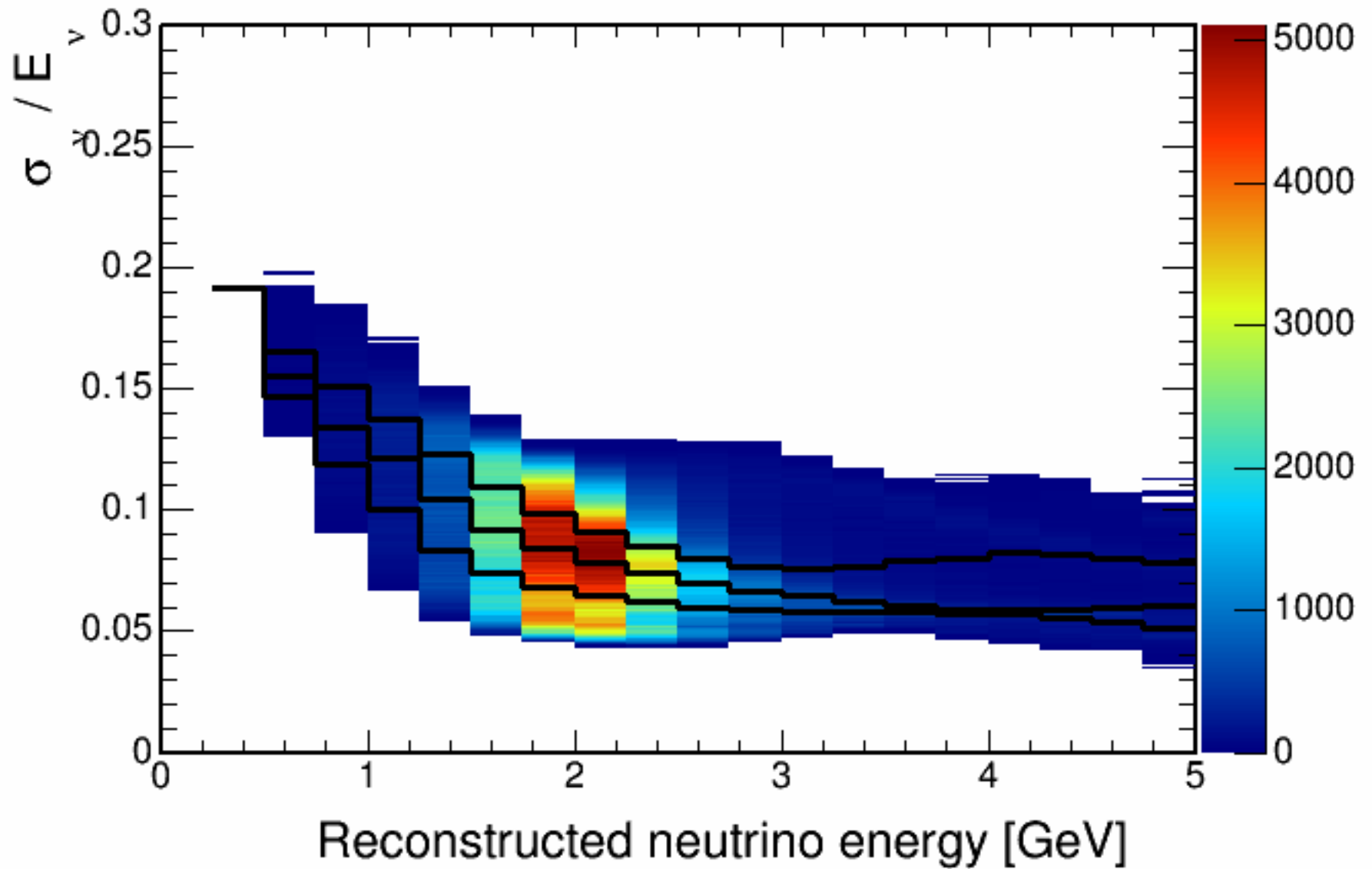
Neutrino energy resolution



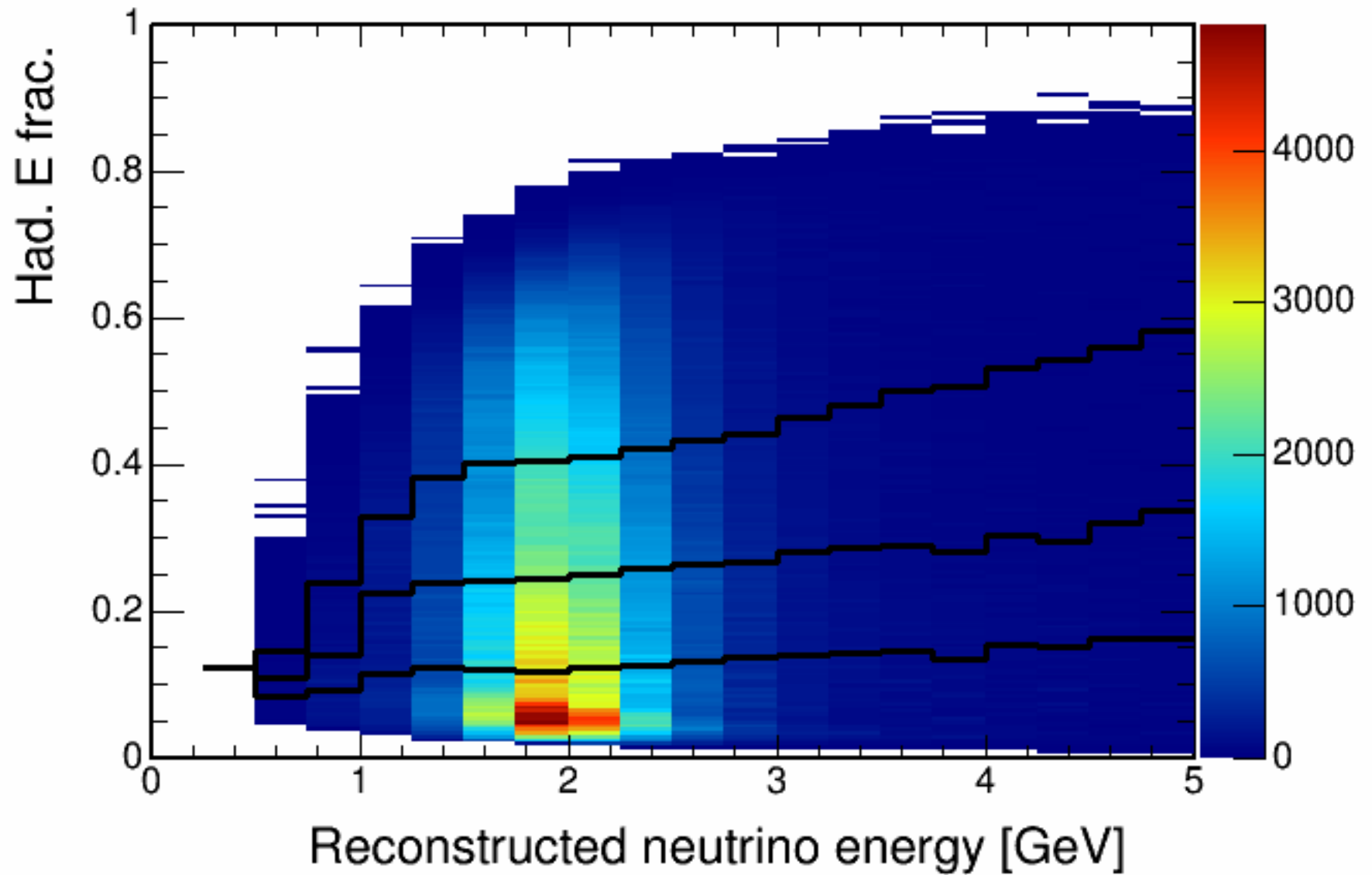
Hadronic energy fraction



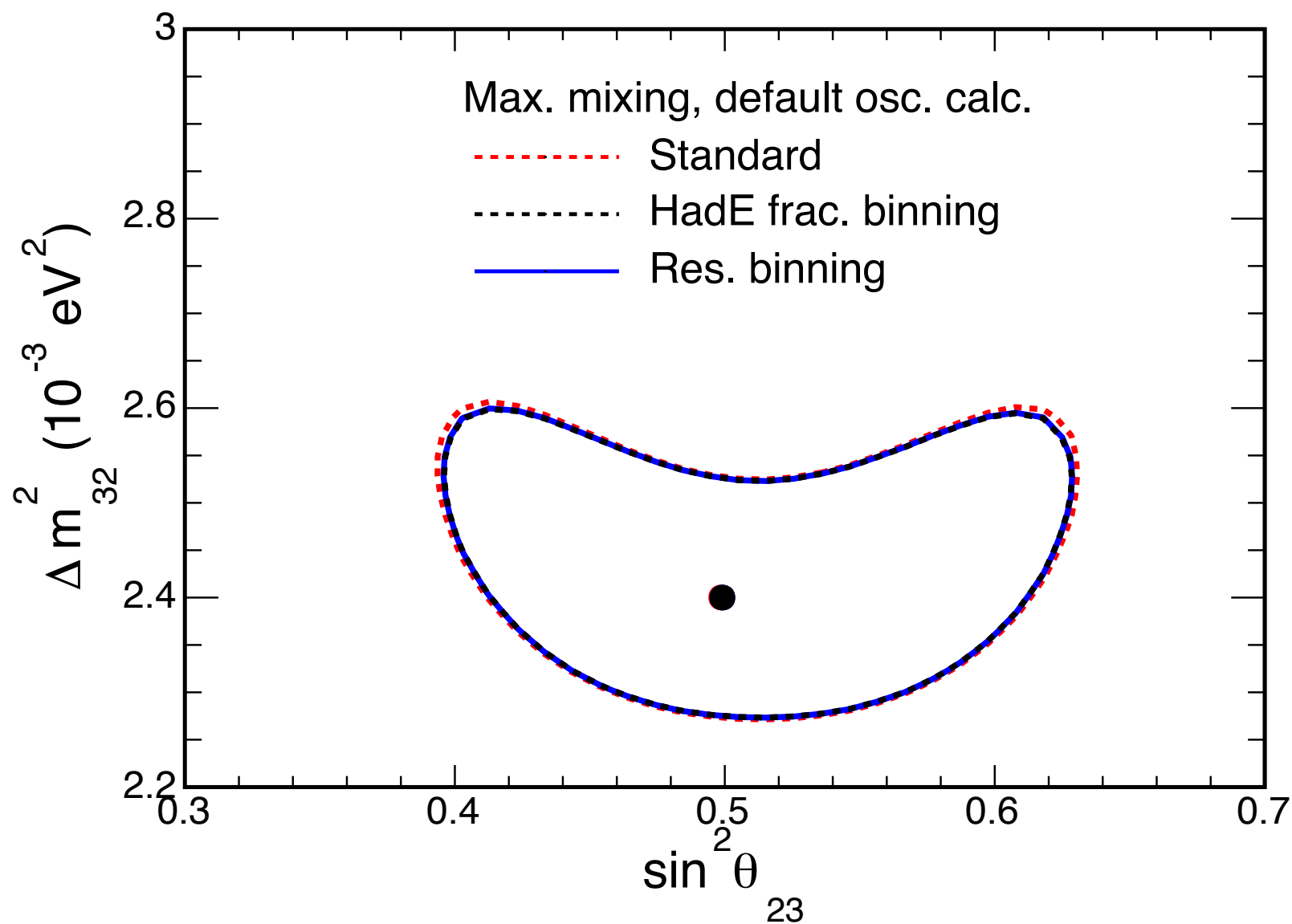
Neutrino energy resolution vs. reco. energy



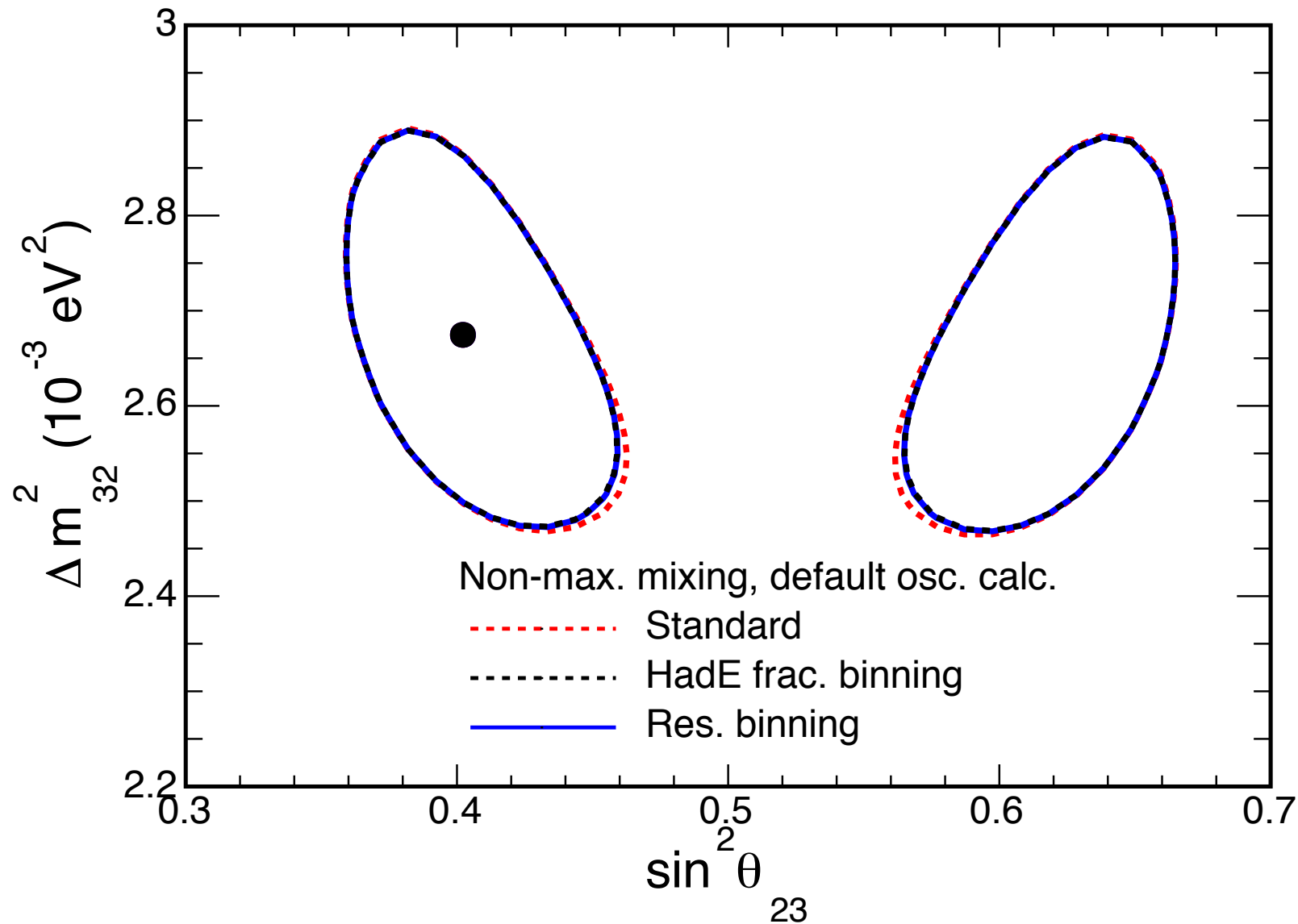
Hadronic energy fraction vs. reco. energy



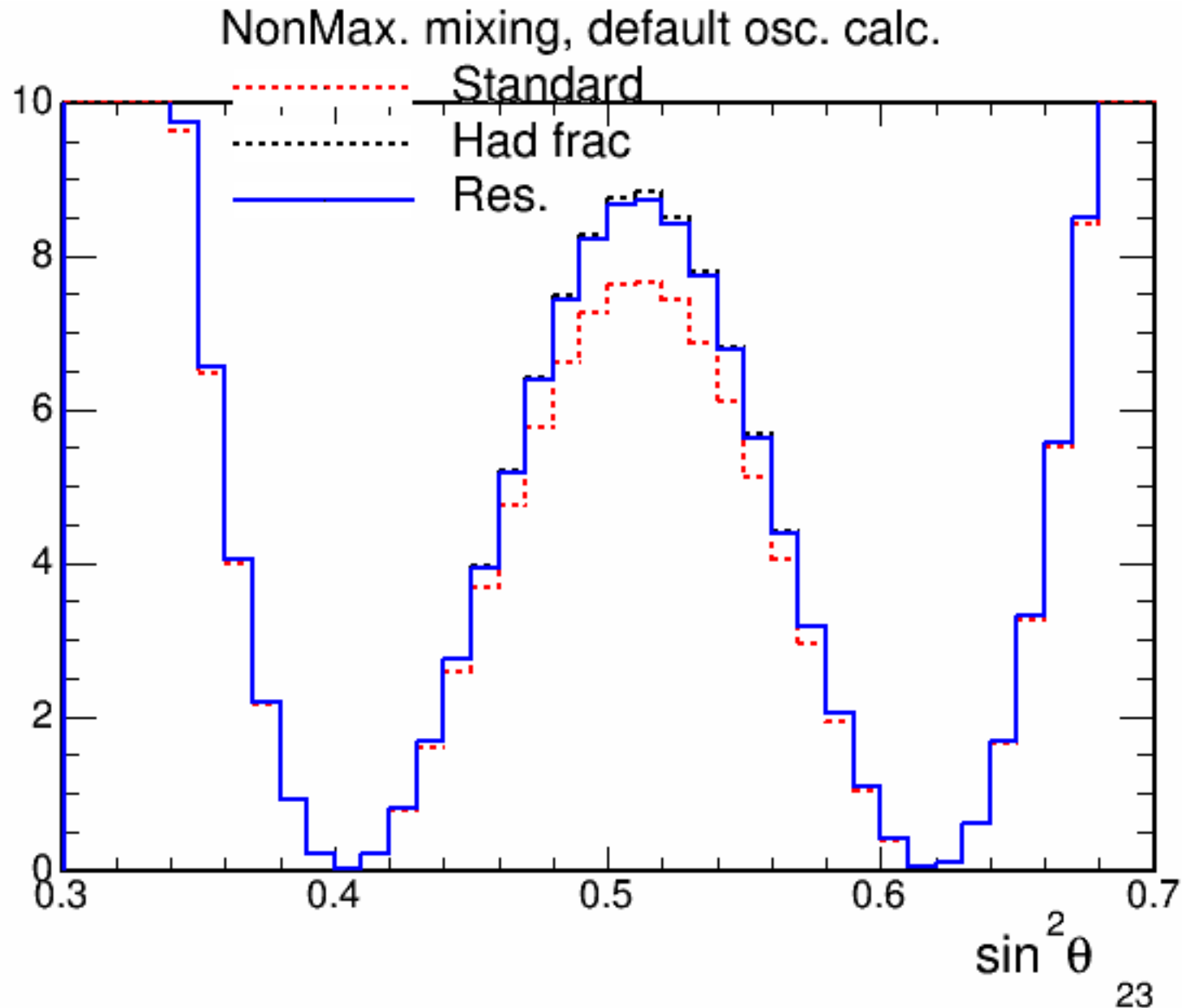
Max. mixing paremeters sensitivity



SA numu result paramters (ssqth23 = 0.4022) sensitivity



SA numu result paramters (ssqth23 = 0.4022) sensitivity



Summary

- Binning events by hadronic energy fraction and by energy resolution produces almost the same sensitivity
 - Hadronic energy fraction binning shows marginally better sensitivity gains

Future plan

- Repeat study including extrapolation and systematics
- Optimise number of energy resolution bins for rejection of maximal mixing

Backup