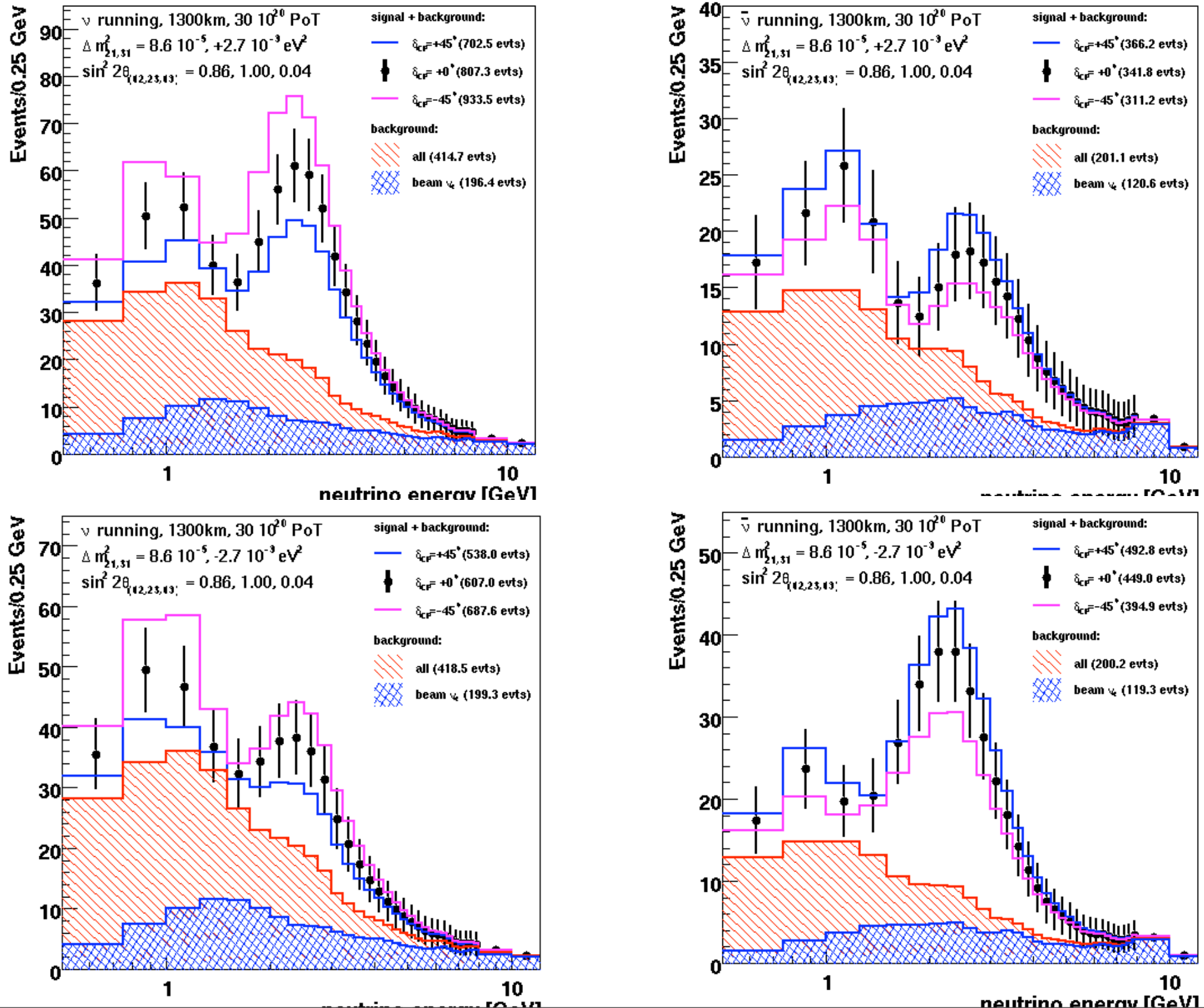
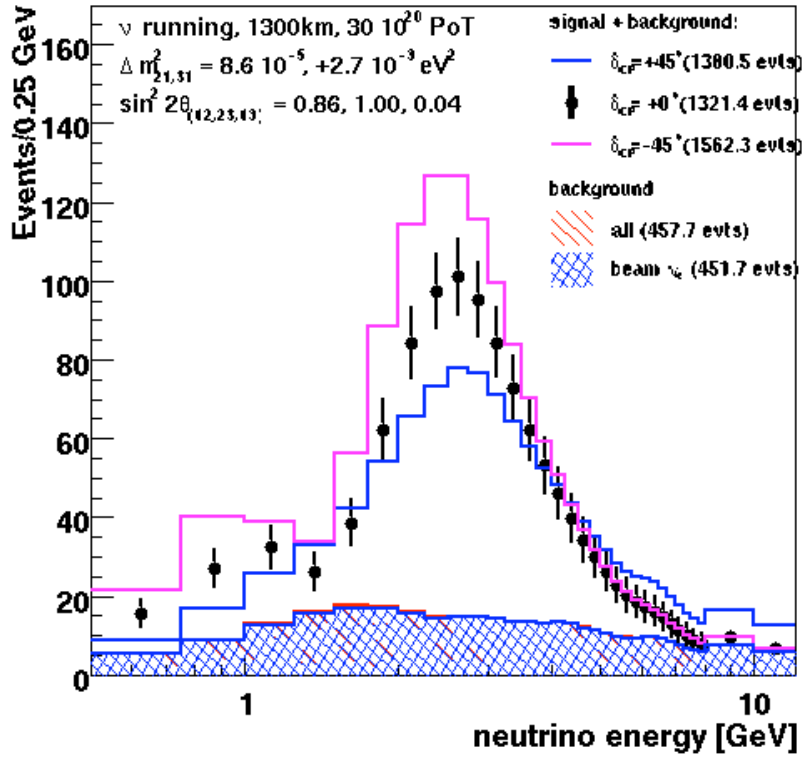
Long baseline plots final results of the FNAL/BNL study

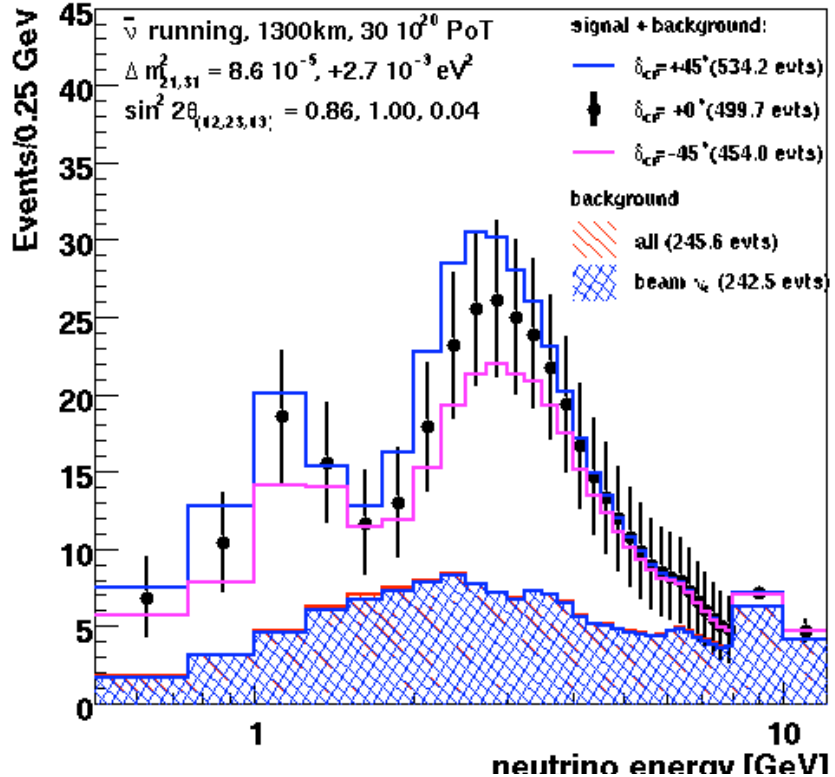
3/21/2007

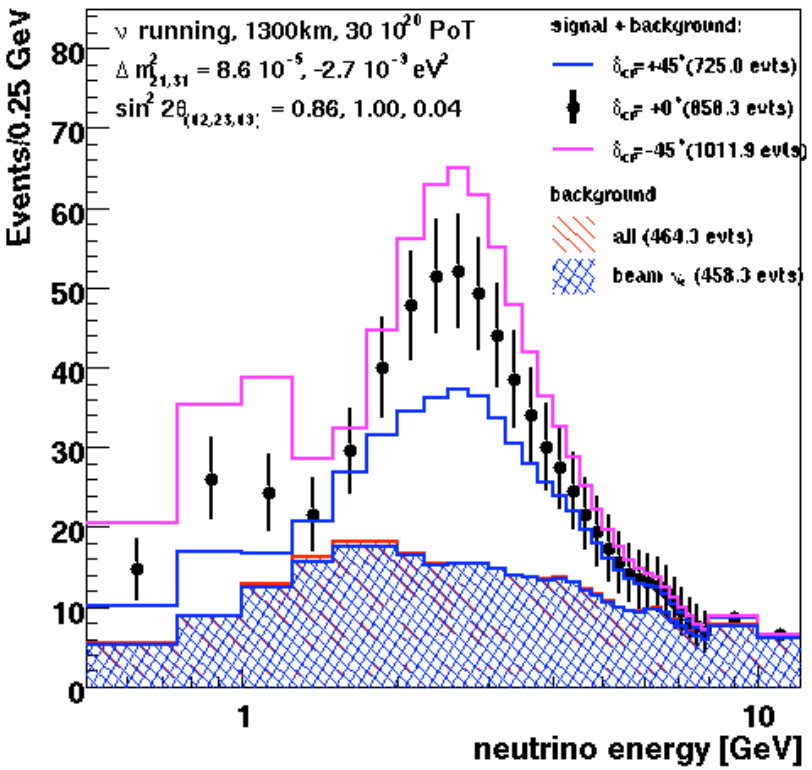
Assumptions

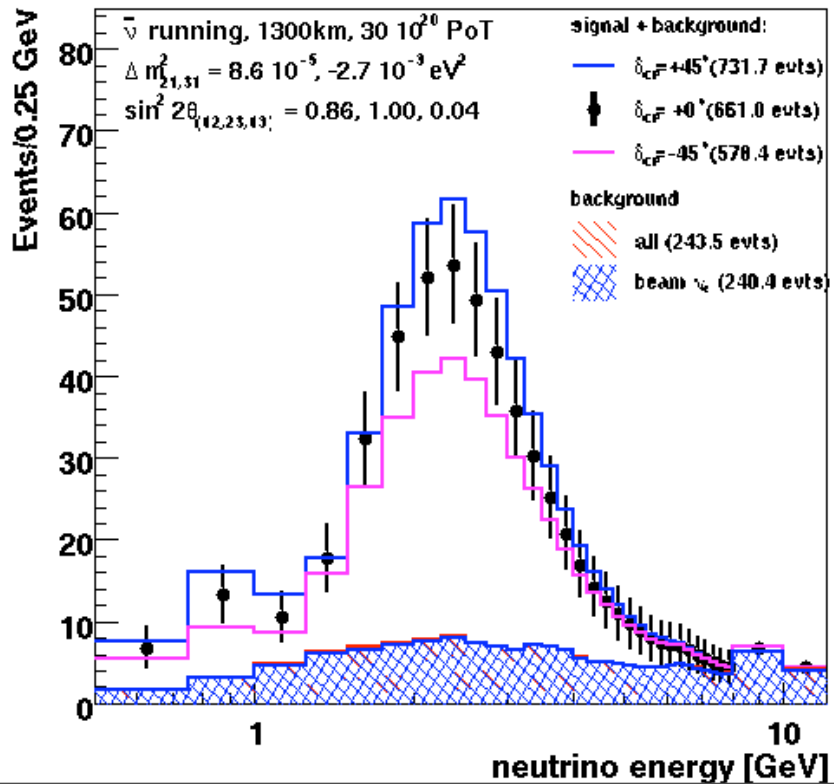
- beam: 120 GeV 0.5 deg
- efficiencies from Yanagisawa for WCh
- for LAR 80% eff for sig. very little NC bkg.
- WCh: 300 kTon fiducial mass, LAR:100kT
- 1300 km (1480 km plots in progress)
- 30e20 protons for each nu and anu

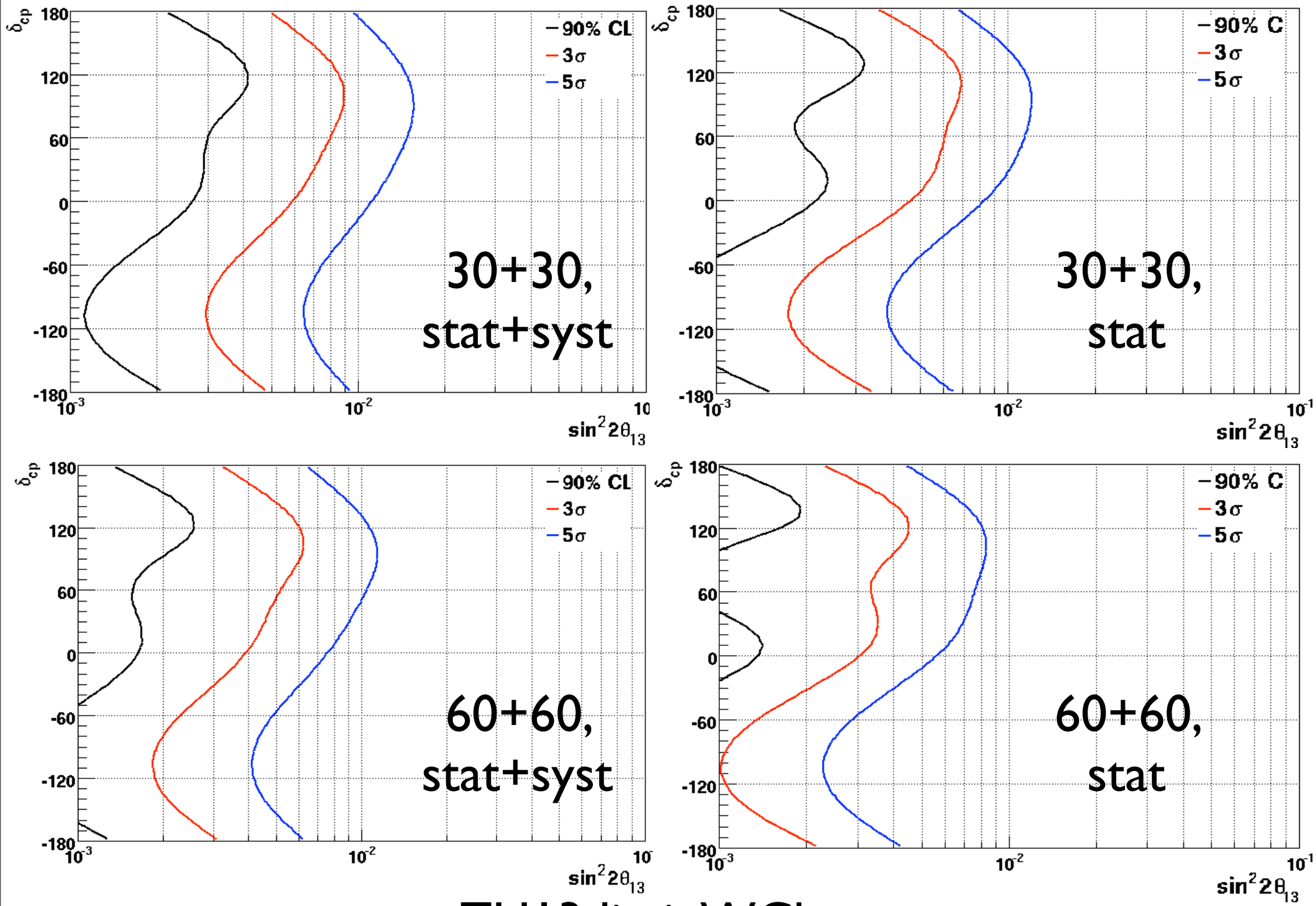

ν running, 1300km, 30 10^20 PoT
Δ m²21,31 = 8.6 10^-5, +2.7 10^-3 eV²
sin² 2θ(12,23,13) = 0.86, 1.00, 0.04
signal + background:
δCP=+45° (702.5 evts)
δCP= +0° (807.3 evts)
δCP=-45° (933.5 evts)
background:
all (414.7 evts)
beam νe (196.4 evts)
Events/0.25 GeV
neutrino energy [GeV]
ν̄ running, 1300km, 30 10^20 PoT
Δ m²21,31 = 8.6 10^-5, +2.7 10^-3 eV²
sin² 2θ(12,23,13) = 0.86, 1.00, 0.04
signal + background:
δCP=+45° (366.2 evts)
δCP= +0° (341.8 evts)
δCP=-45° (311.2 evts)
background:
all (201.1 evts)
beam νe (120.6 evts)
Events/0.25 GeV
ν running, 1300km, 30 10^20 PoT
Δ m²21,31 = 8.6 10^-5, -2.7 10^-3 eV²
sin² 2θ(12,23,13) = 0.86, 1.00, 0.04
signal + background:
δCP=+45° (538.0 evts)
δCP= +0° (607.0 evts)
δCP=-45° (687.6 evts)
background:
all (418.5 evts)
beam νe (199.3 evts)
Events/0.25 GeV
ν̄ running, 1300km, 30 10^20 PoT
Δ m²21,31 = 8.6 10^-5, -2.7 10^-3 eV²
sin² 2θ(12,23,13) = 0.86, 1.00, 0.04
signal + background:
δCP=+45° (492.8 evts)
δCP= +0° (449.0 evts)
δCP=-45° (394.9 evts)
background:
all (200.2 evts)
beam νe (119.3 evts)
Events/0.25 GeV
neutrino energy [GeV]


ν running, 1300km, 30 10^20 PoT
Δ m²21,31 = 8.6 10^-5, +2.7 10^-3 eV²
sin² 2θ(12,23,13) = 0.86, 1.00, 0.04
signal + background:
δCP=+45°(1380.5 evts)
δCP= +0°(1321.4 evts)
δCP=-45°(1562.3 evts)
background
all (457.7 evts)
beam νe (451.7 evts)
Events/0.25 GeV
neutrino energy [GeV]

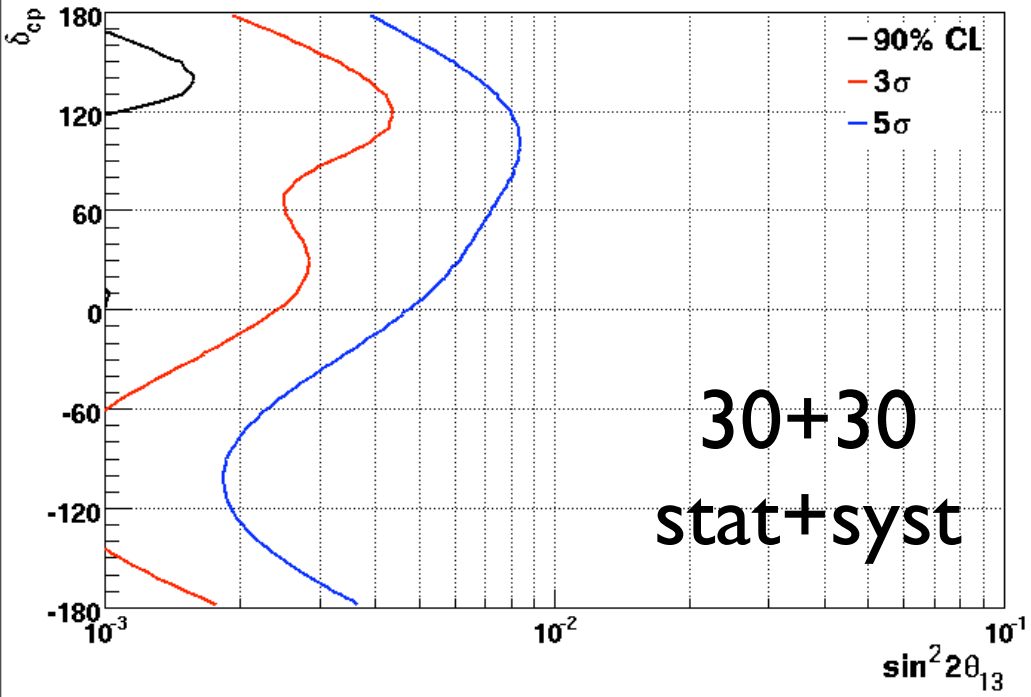

ν̄ running, 1300km, 30 10^20 PoT
Δ m²21,31 = 8.6 10^-5, +2.7 10^-3 eV²
sin² 2θ(12,23,13) = 0.86, 1.00, 0.04
signal + background:
δCP=+45°(534.2 evts)
δCP= +0°(499.7 evts)
δCP=-45°(454.0 evts)
background
all (245.6 evts)
beam νe (242.5 evts)
Events/0.25 GeV
neutrino energy [GeV]

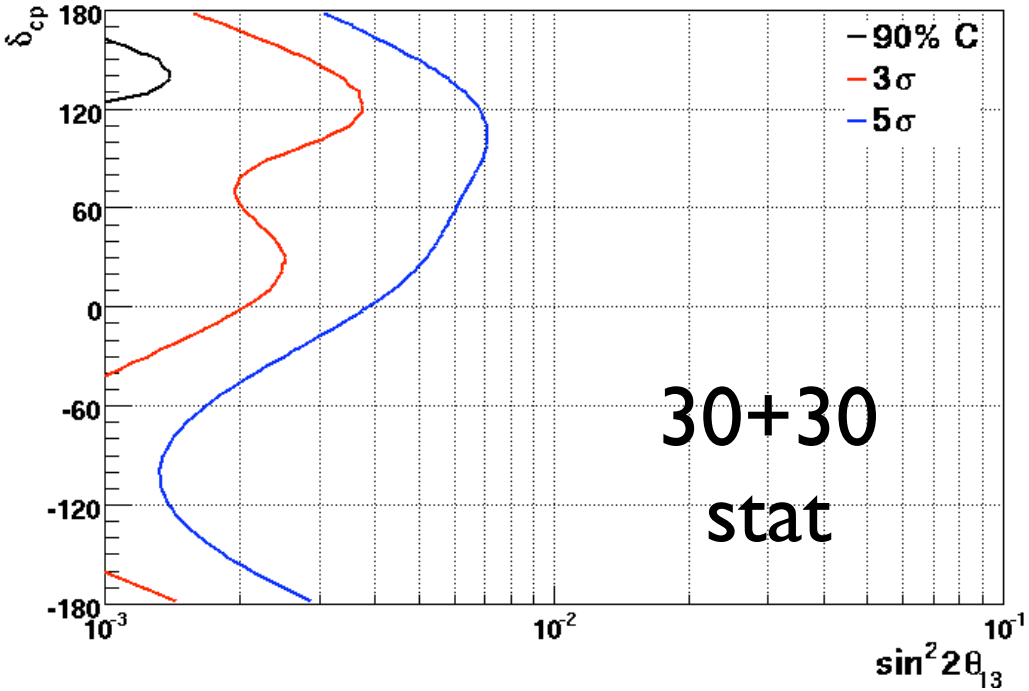

ν running, 1300km, 30 10^20 PoT
Δ m²21,31 = 8.6 10^-5, -2.7 10^-3 eV²
sin² 2θ(12,23,13) = 0.86, 1.00, 0.04
signal + background:
δCP=+45°(725.0 evts)
δCP= +0°(858.3 evts)
δCP=-45°(1011.9 evts)
background
all (464.3 evts)
beam νe (458.3 evts)
Events/0.25 GeV
neutrino energy [GeV]


ν̄ running, 1300km, 30 10^20 PoT
Δ m²21,31 = 8.6 10^-5, -2.7 10^-3 eV²
sin² 2θ(12,23,13) = 0.86, 1.00, 0.04
signal + background:
δCP=+45°(731.7 evts)
δCP= +0°(661.0 evts)
δCP=-45°(578.4 evts)
background
all (243.5 evts)
beam νe (240.4 evts)
Events/0.25 GeV
neutrino energy [GeV]

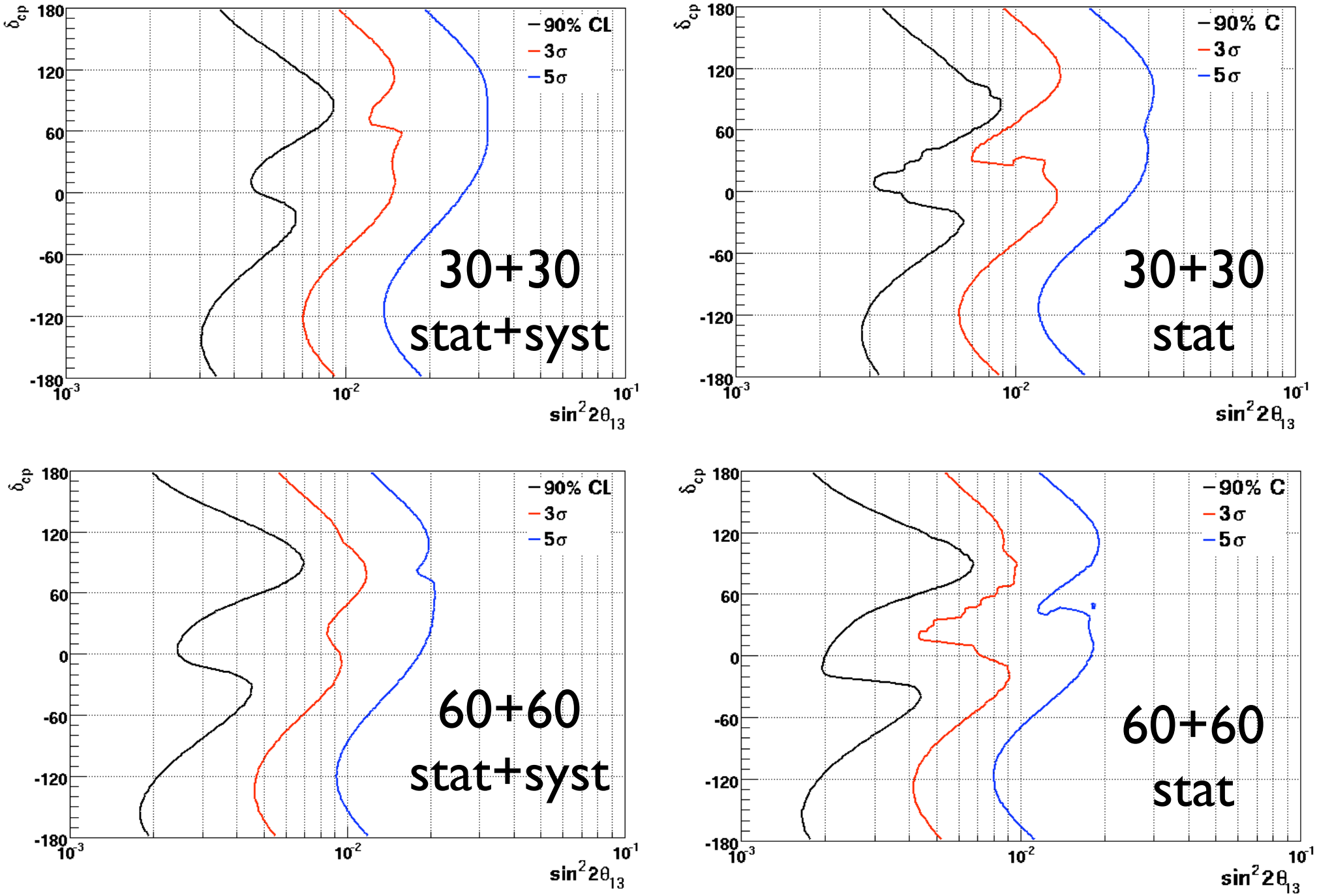


TH13 limit WCh

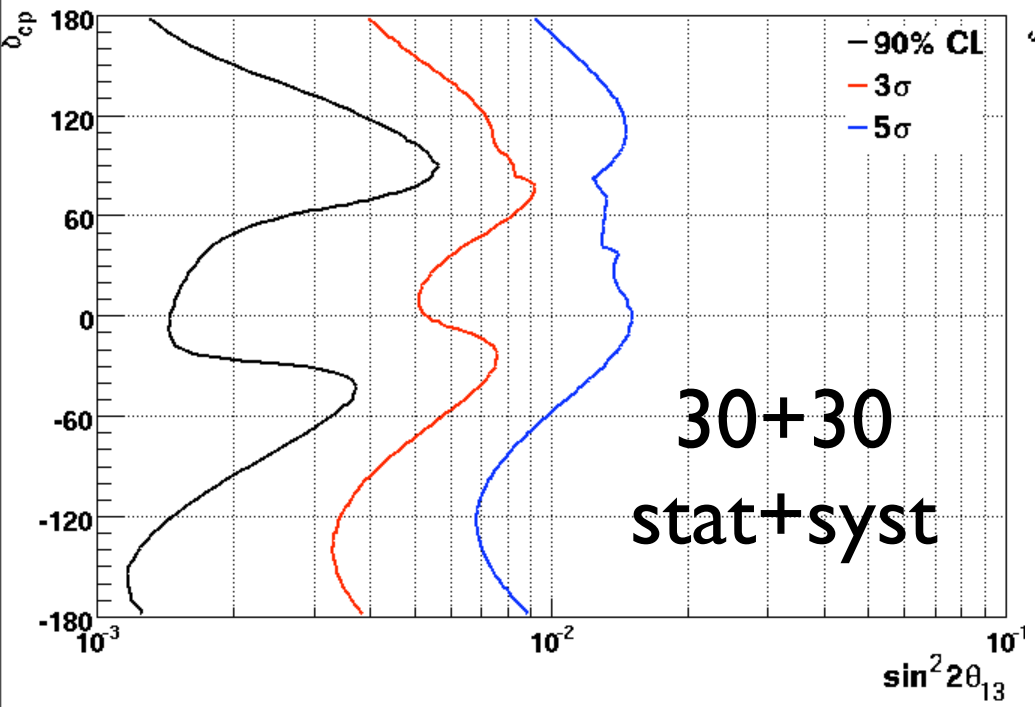


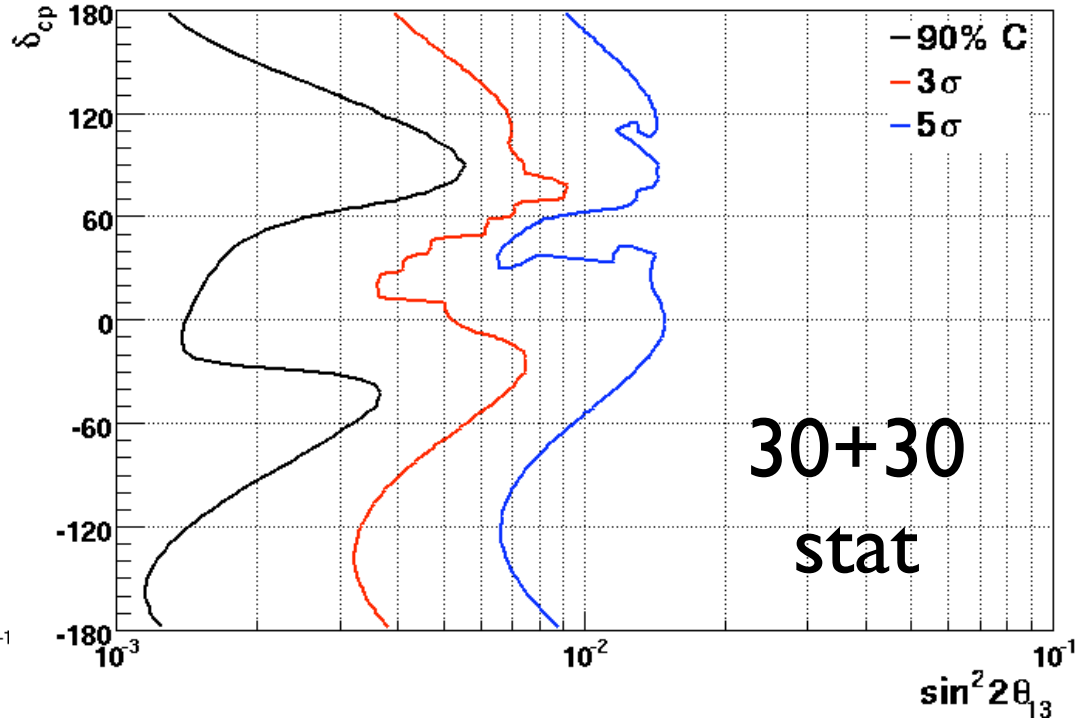


th13 limit LAR

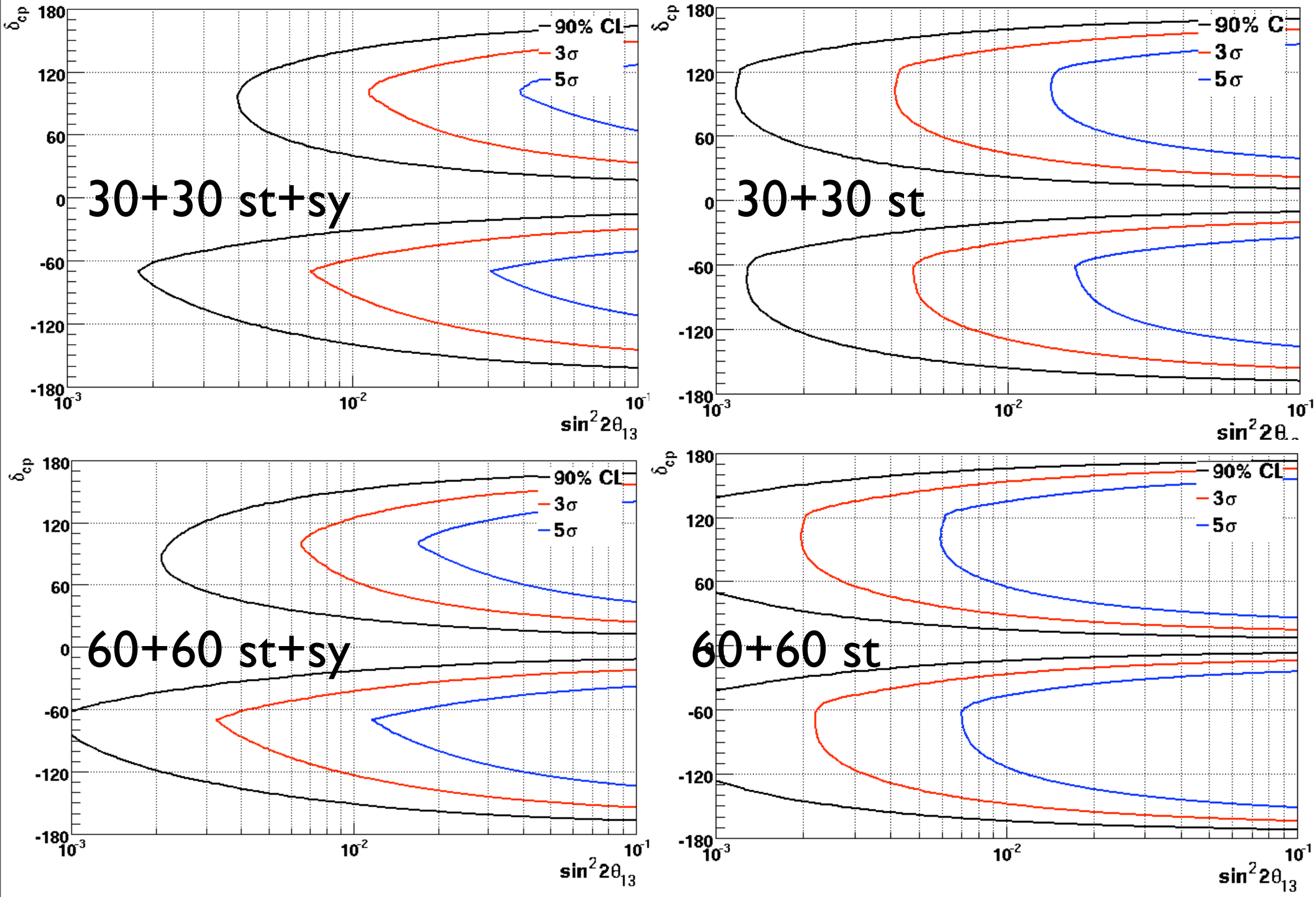


mass hierarchy WCh

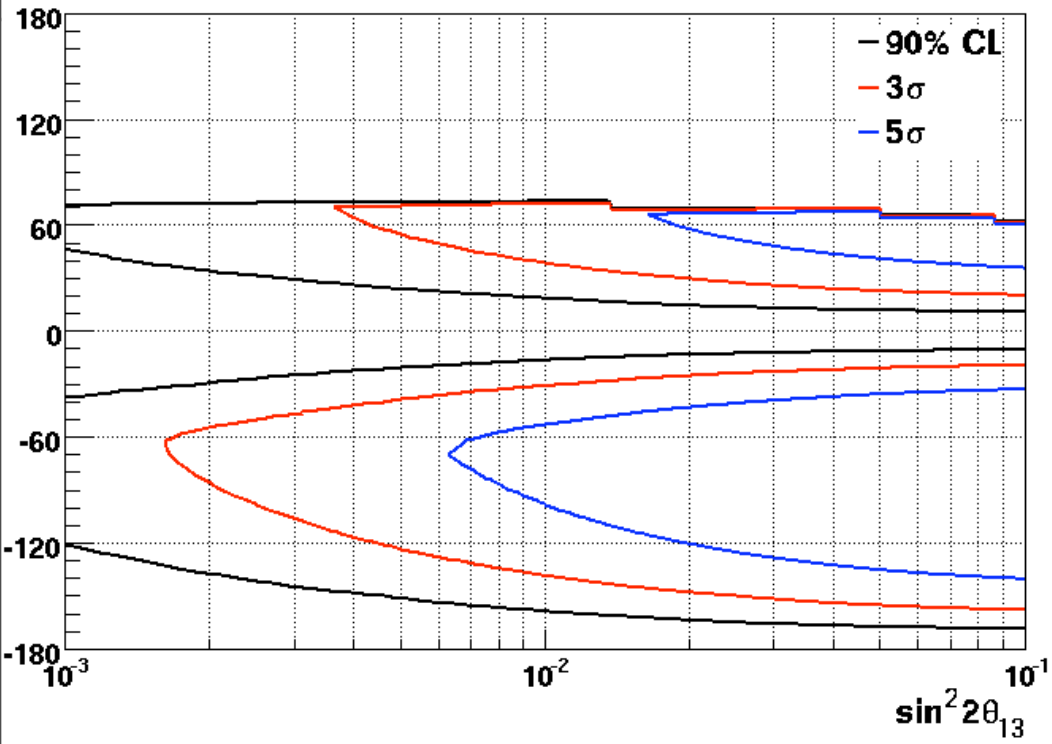




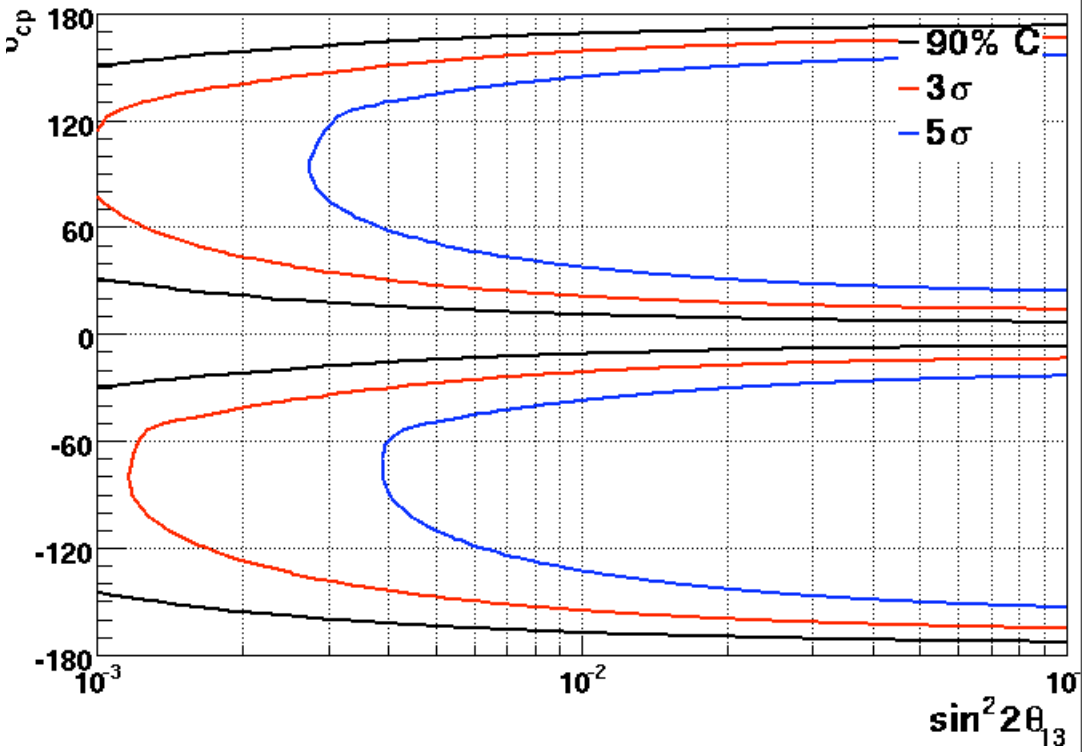
mass hierarchy LAR



CP violation exclusion WCh

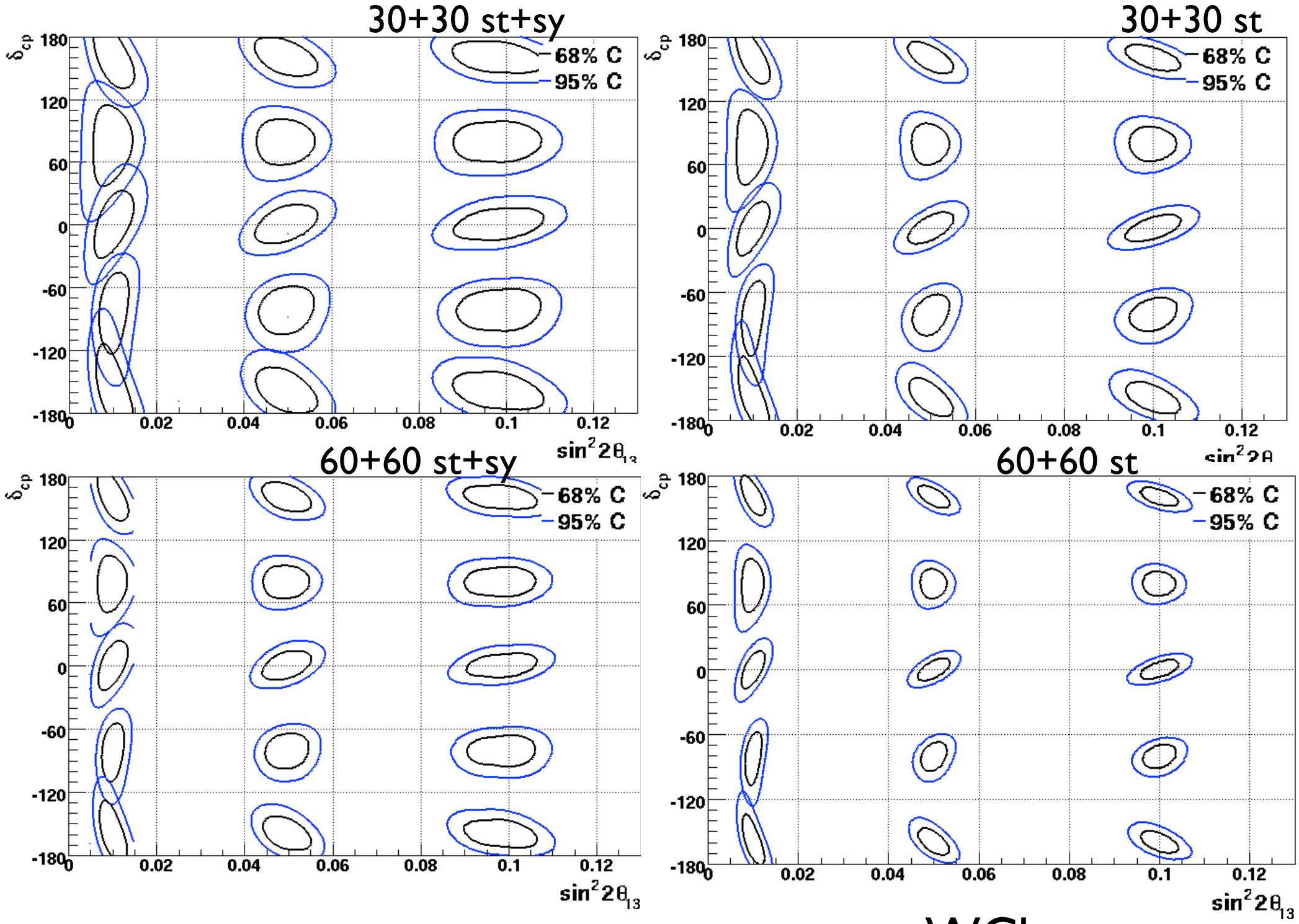


30+30 st+sy

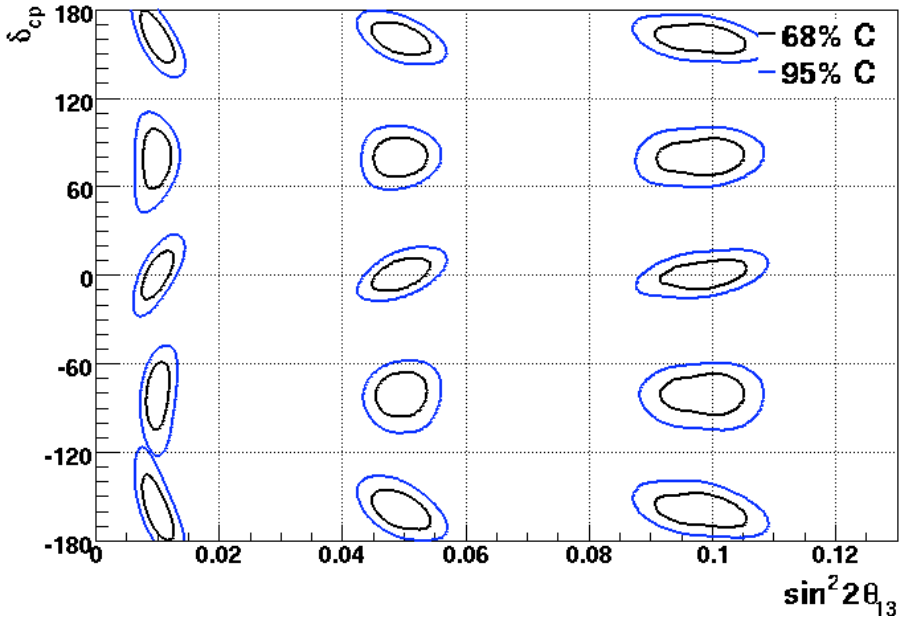


30+30 st

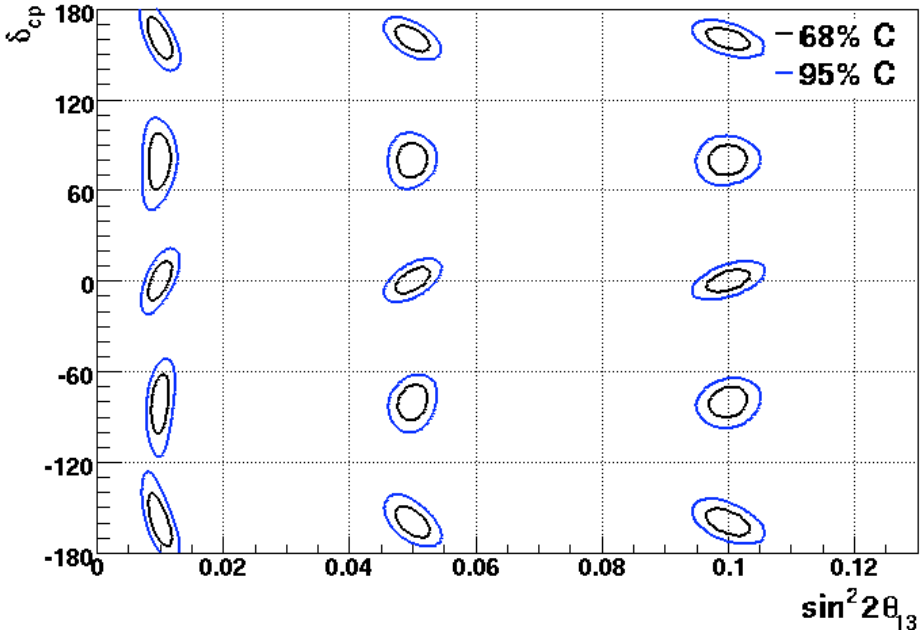
CP exclusion LAR



parameter measurement WCh



30+30 st+sy



30+30 st

parameter measurement LAR

Conclusions