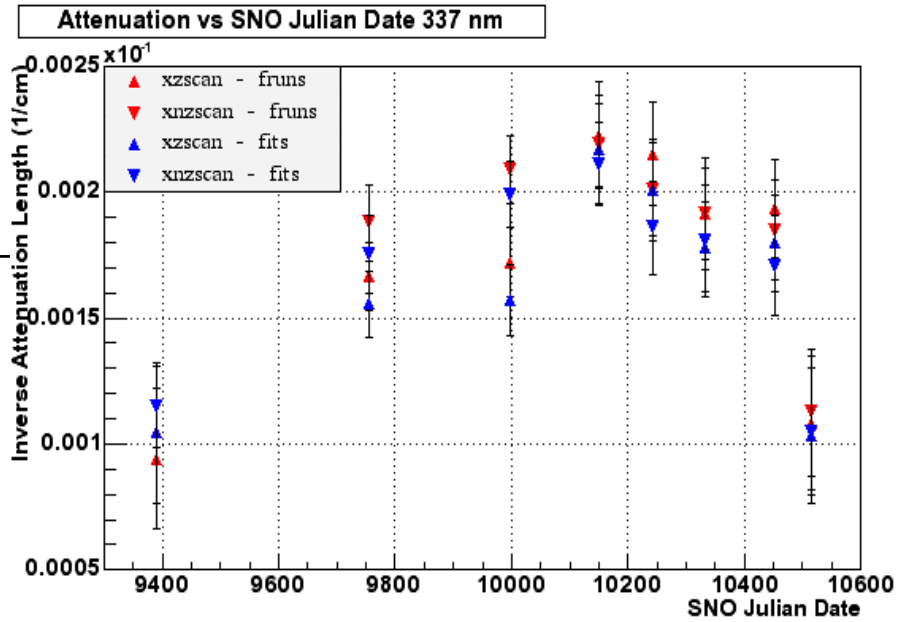
Recent news in optics

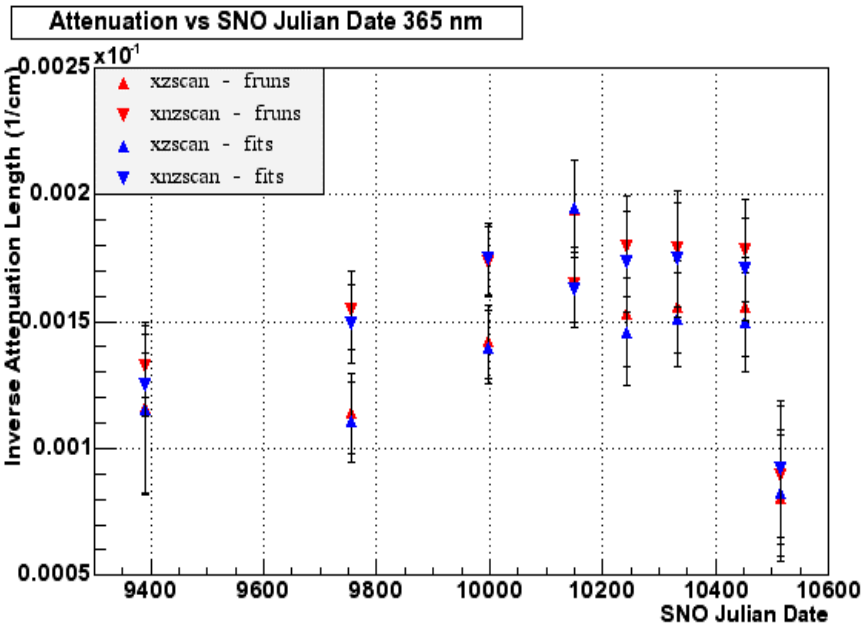
- Diagonal analysis of post-salt D_2O
- PMT Efficiency Variability in the fits
- Laserball in SNOMAN
- NCD Mask Function

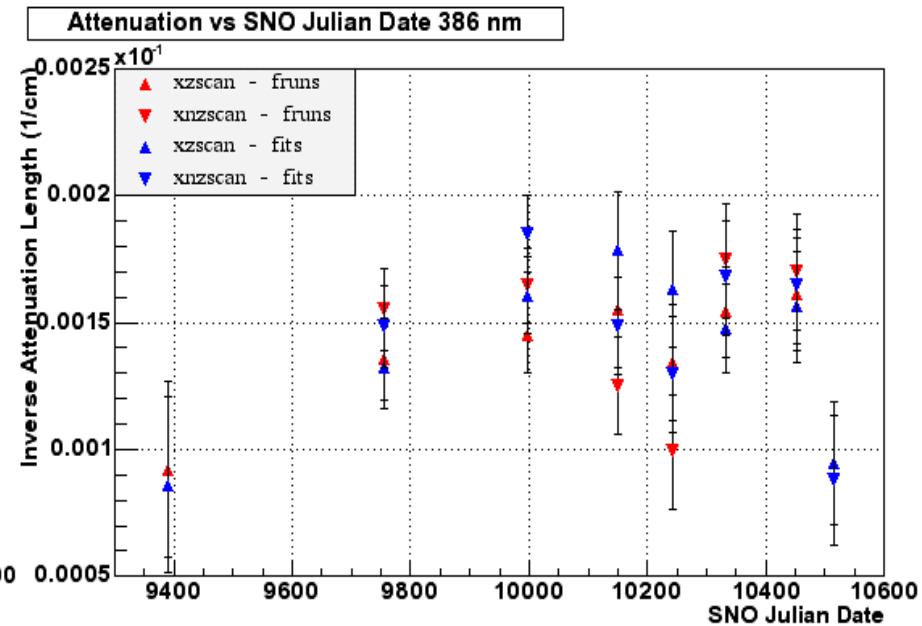
José Maneira
ECG meeting, Carleton Univ.
November 12, 2003

Diagonal

- D_2O attenuation

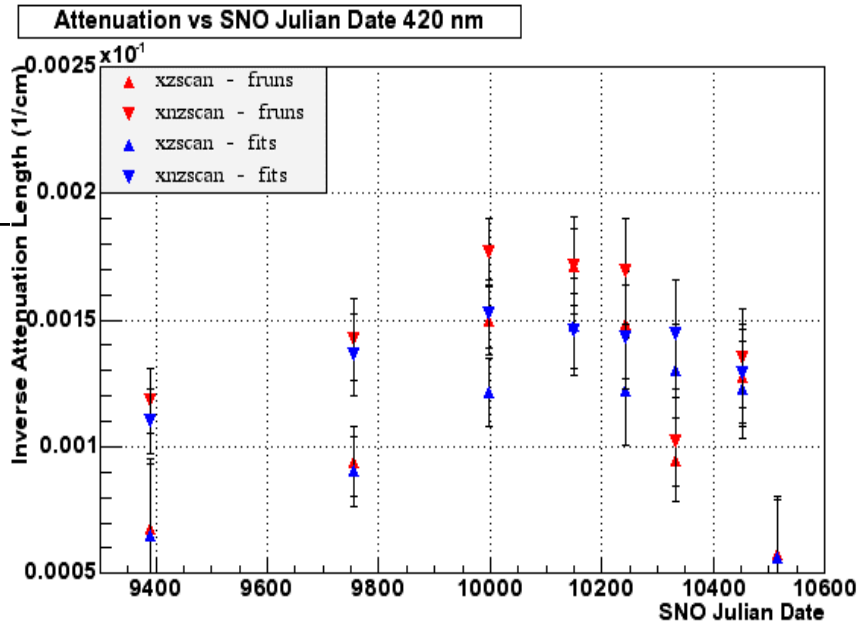


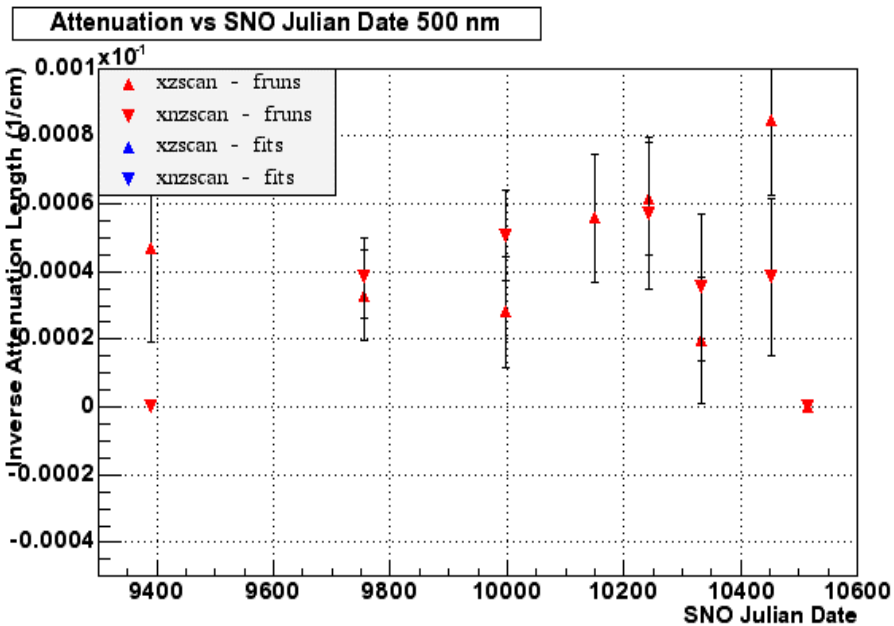


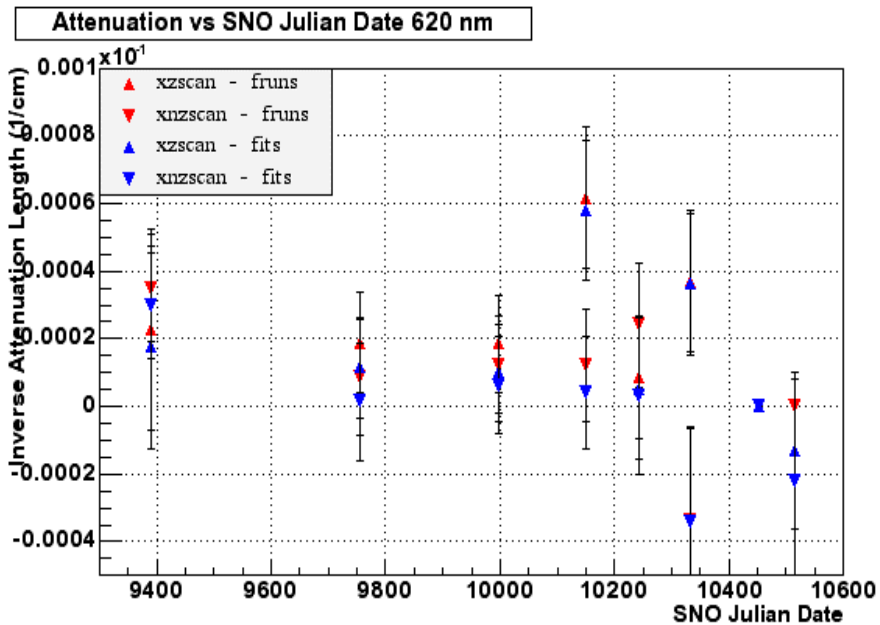


Diagonal

- D_2O attenuation

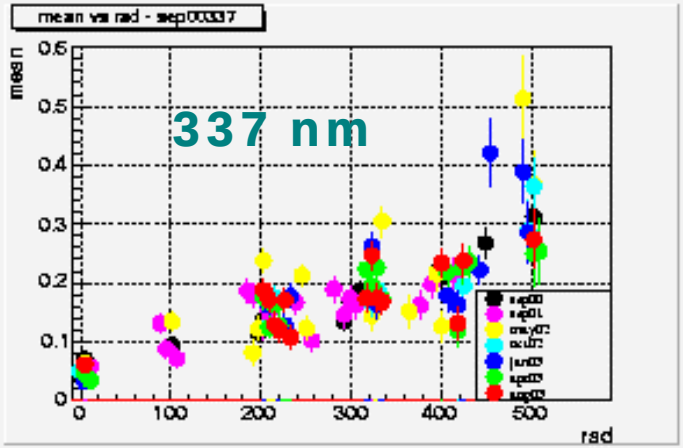


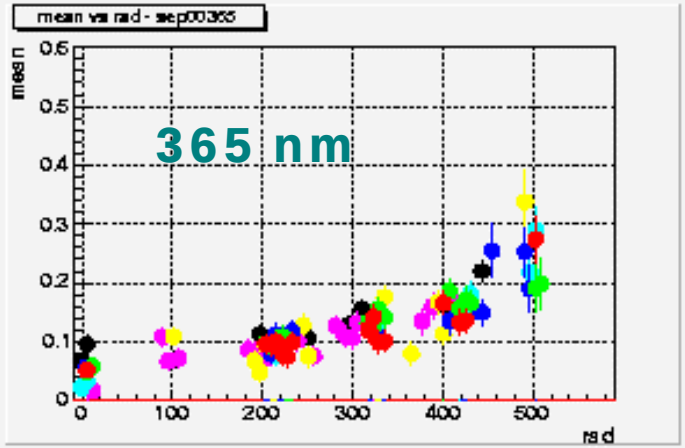


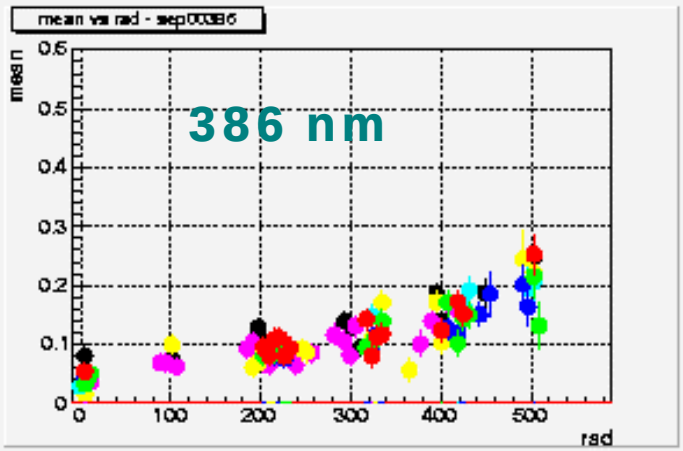


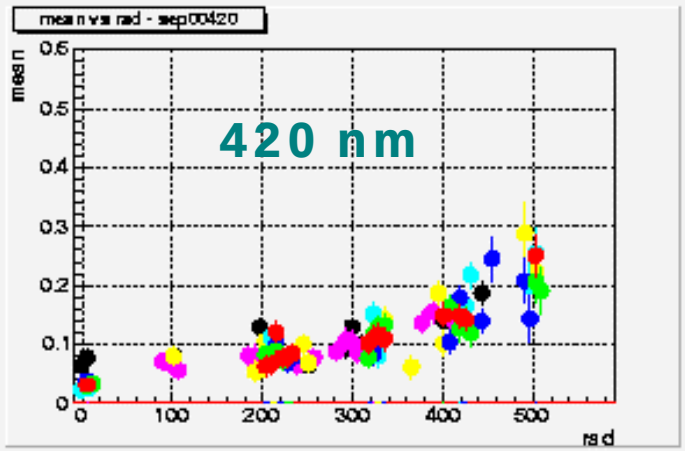
Mean of QOCAFit pulls vs. Radius

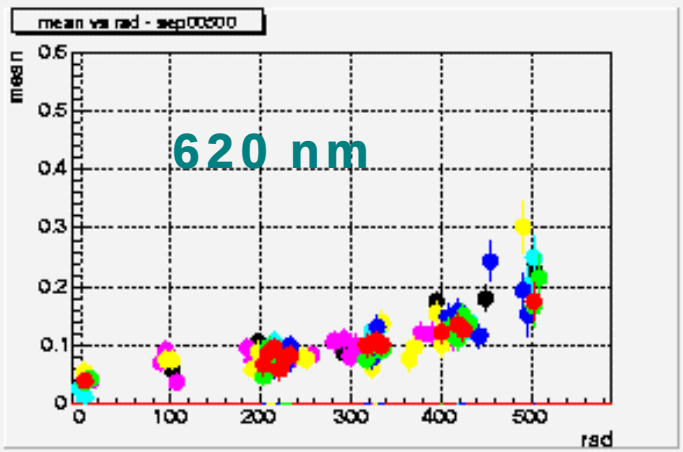
All scans up to Aug03 (last salt)

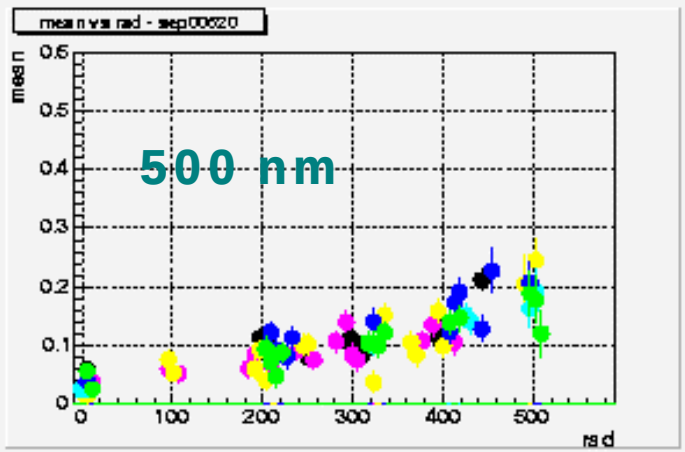






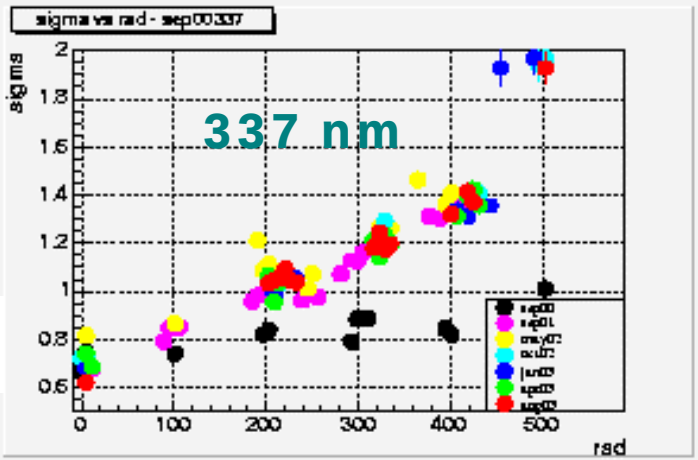


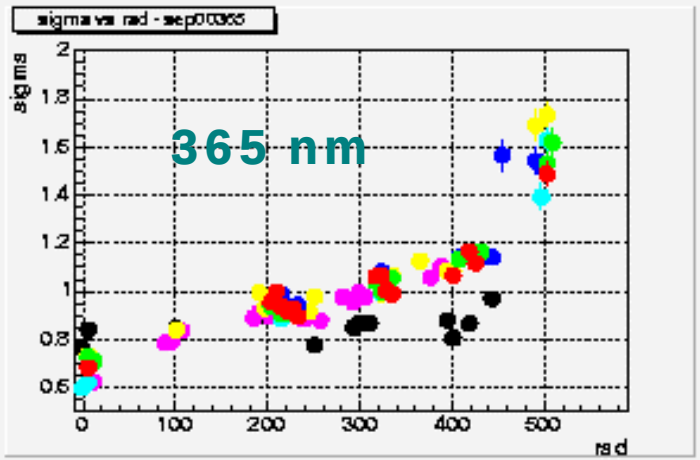


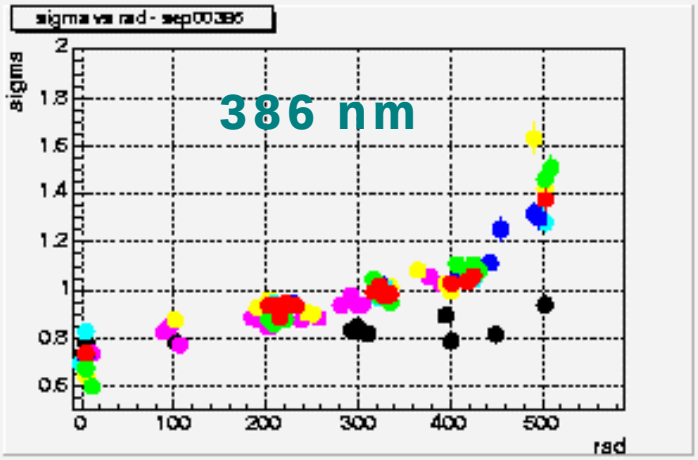


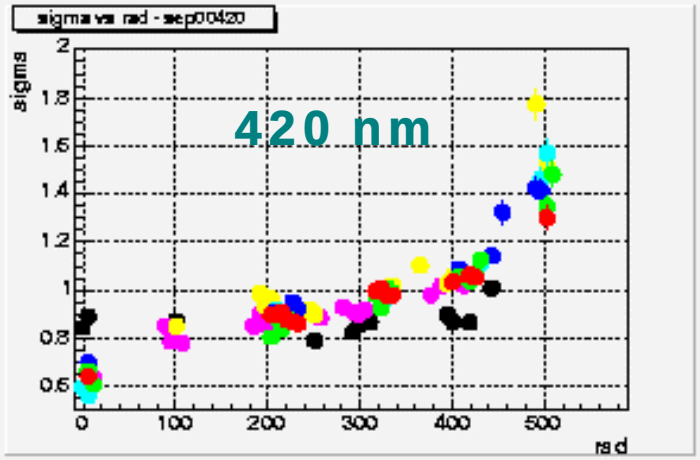
Spread of QOCAFit pulls vs. Radius

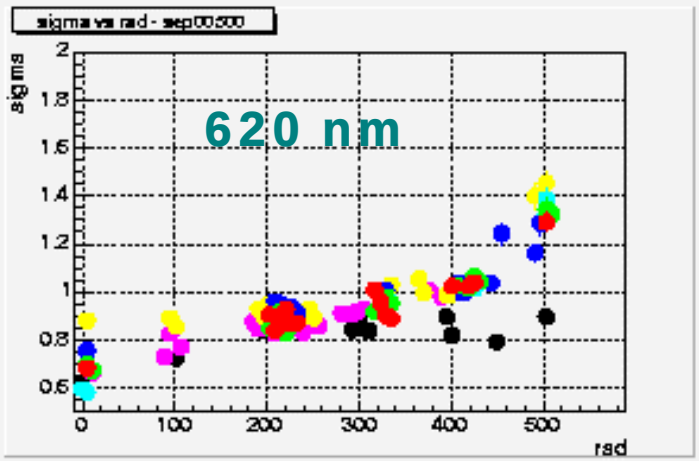
All scans up to Aug03 (last salt)

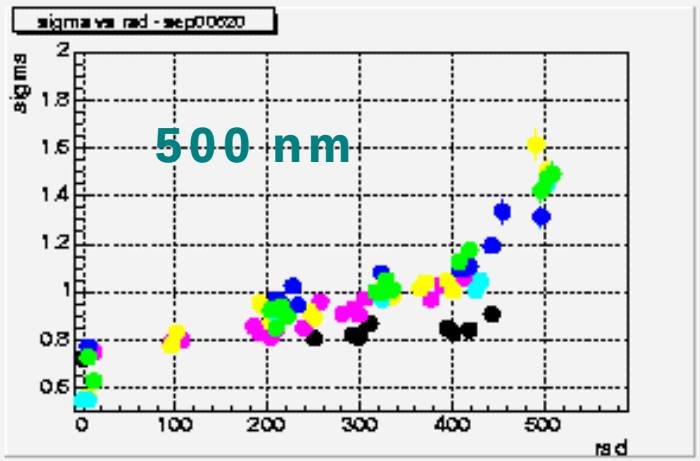










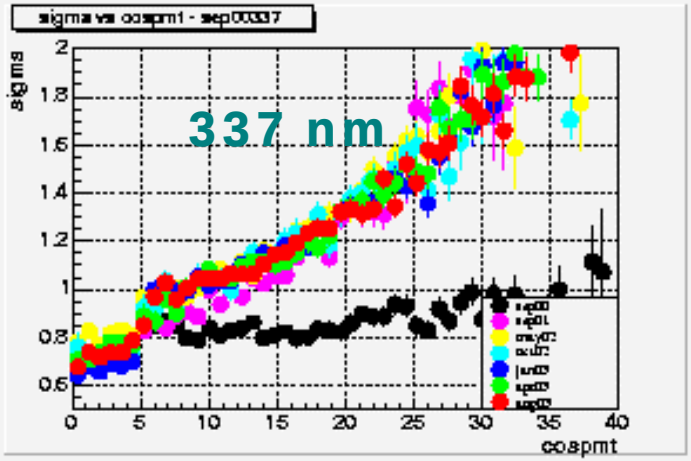


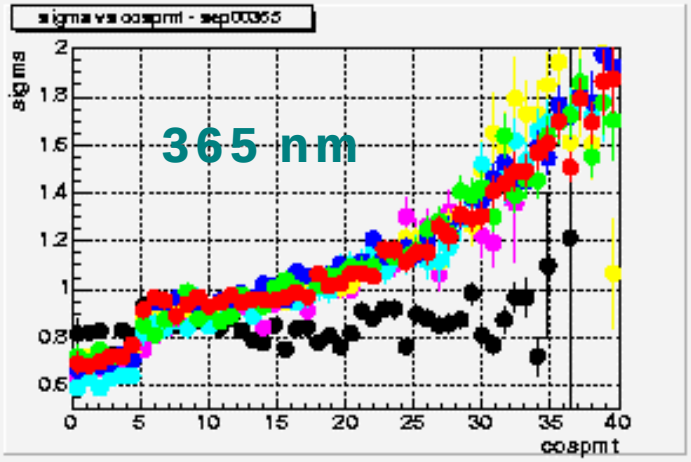
Spread of QOCAFit pulls vs. PMT Incid. angle

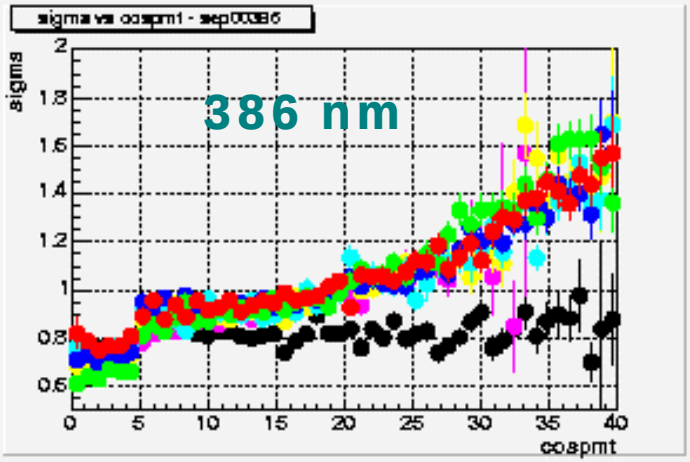
All scans up to Aug03 (last salt)

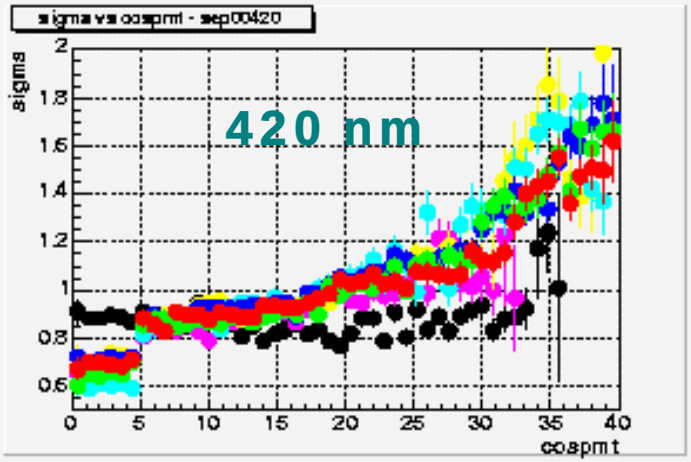
What's different in Sep00 (pre-salt)?

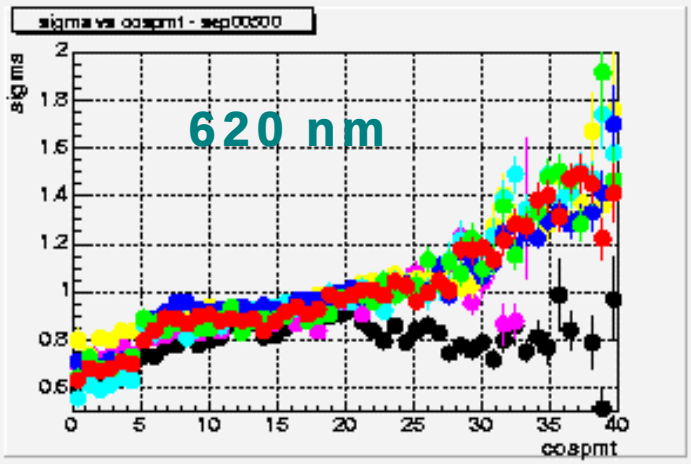
Angular dependence of PMT error factor in χ^2 was hard-coded for Sep00 but not for salt

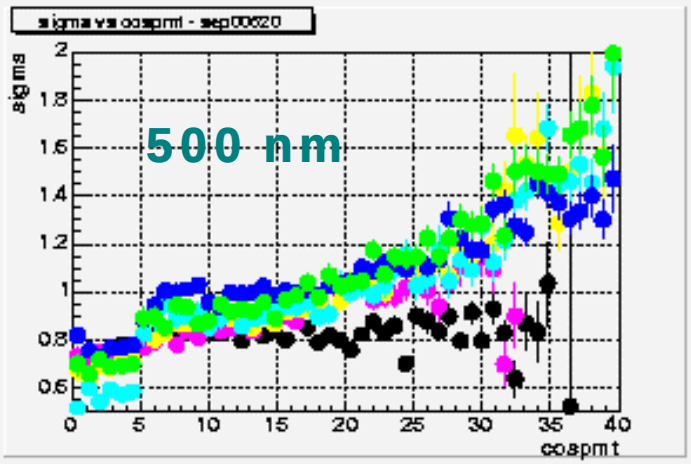










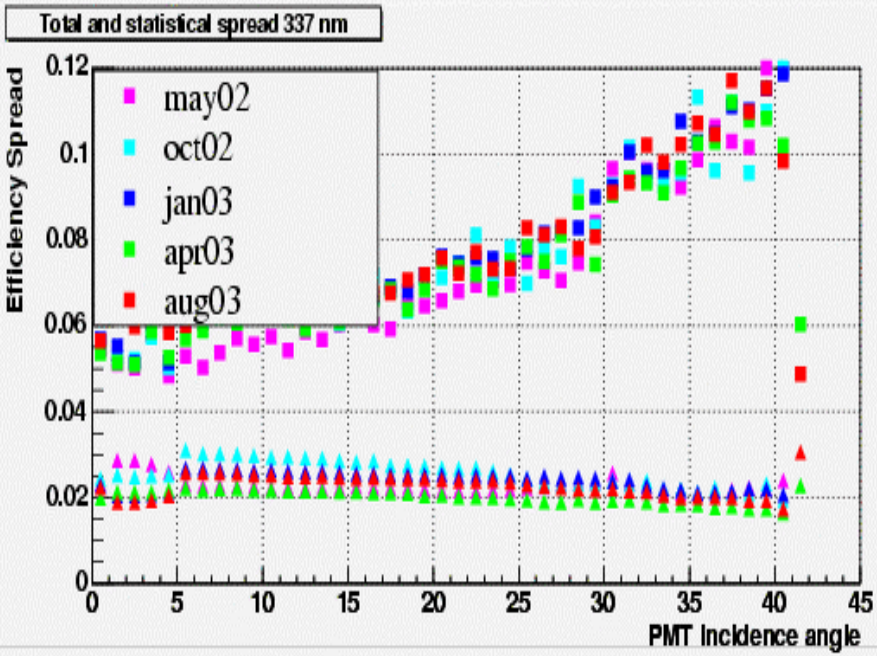


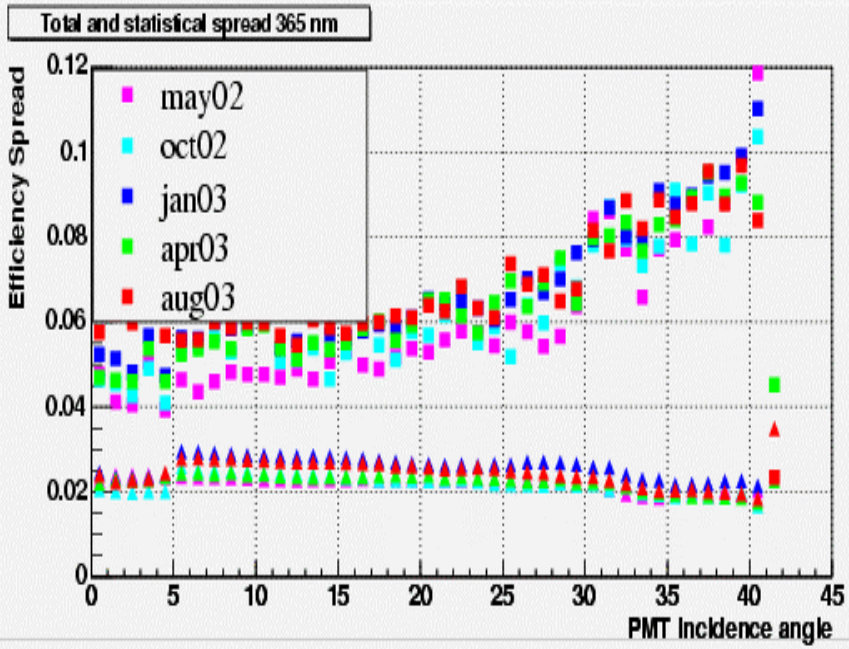
PMT efficiency variability

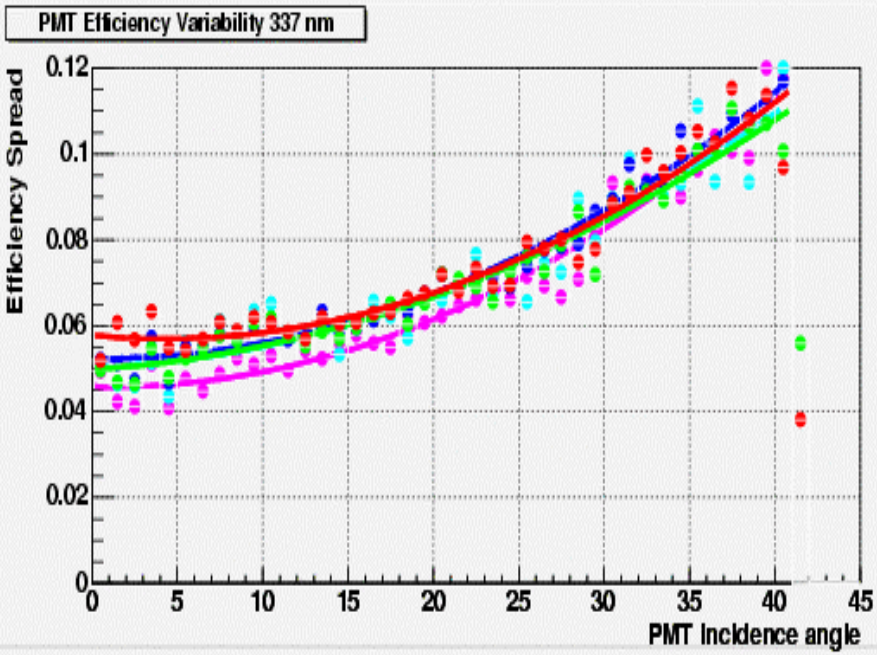
- Following Chris Ouellet's work, use QOCAFit efficiencies
- Normalize each PMT to average efficiency in a scan
- Quadratically subtract the $1/\sqrt{\text{occupancy}}$ from the efficiency RMS
- Remove dependency from optics
- Remove tube-to-tube variations
- Remove statistical spread

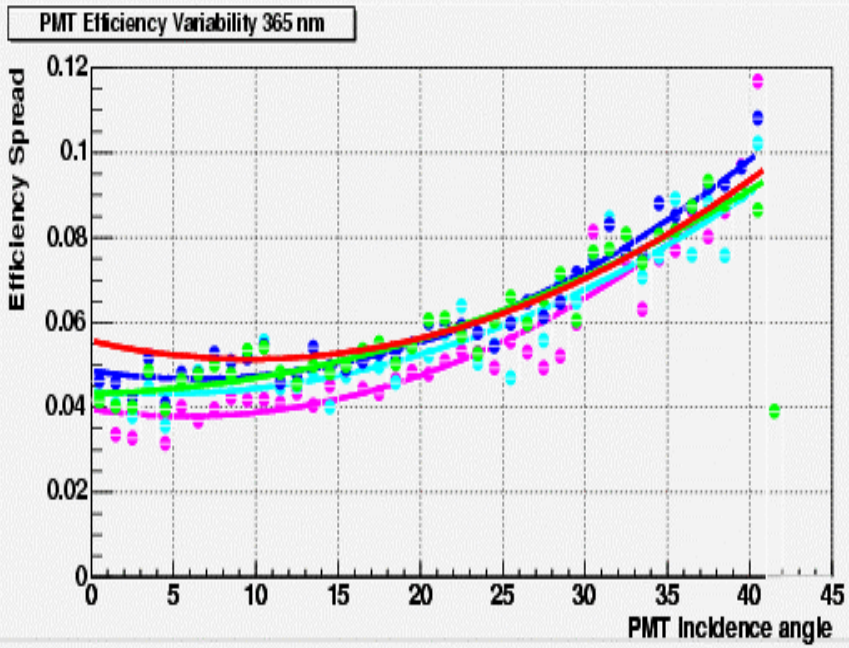
337 nm

365 nm

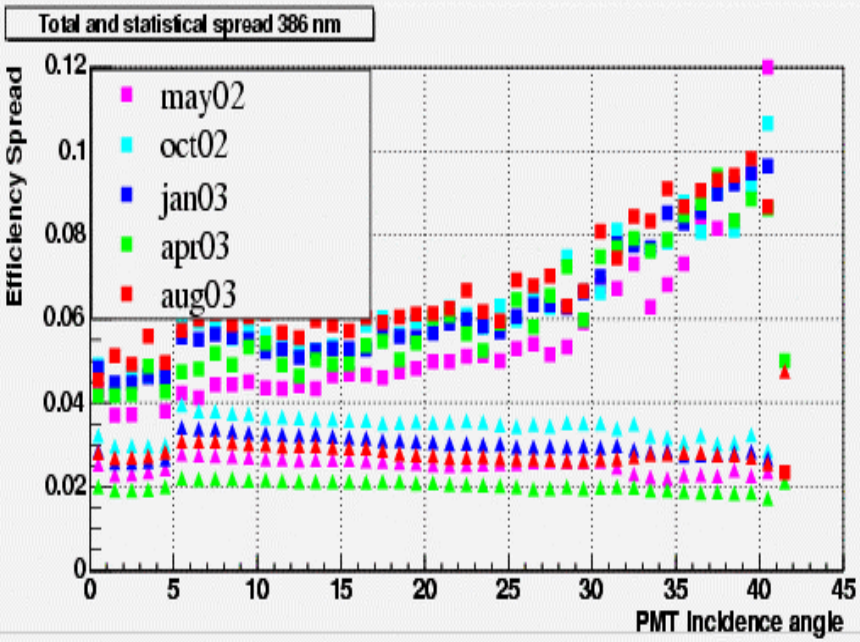

Total and statistical spread 337 nm
may02
oct02
jan03
apr03
aug03
Efficiency Spread
PMT Incidence angle

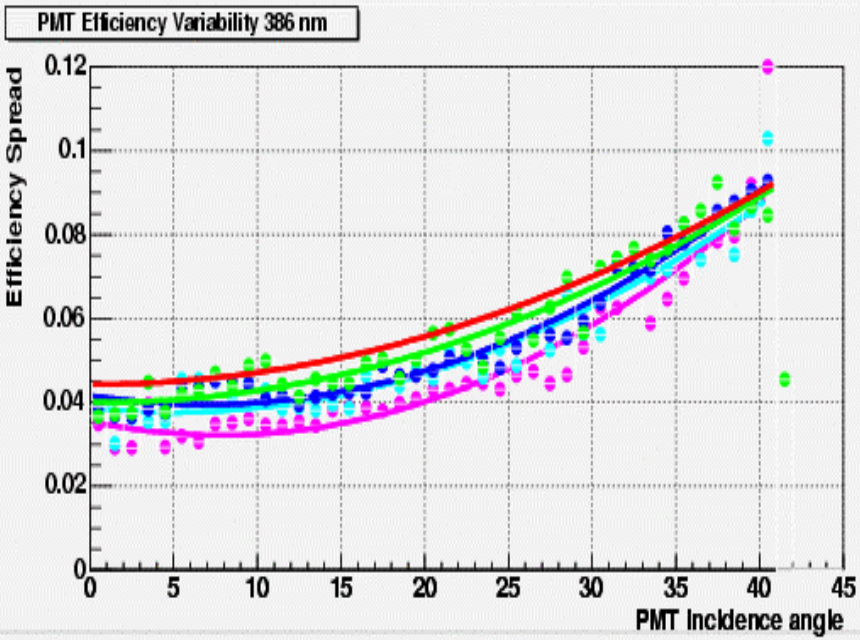

Total and statistical spread 365 nm
may02
oct02
jan03
apr03
aug03
Efficiency Spread
PMT Incidence angle


PMT Efficiency Variability 337 nm
Efficiency Spread
PMT Incidence angle

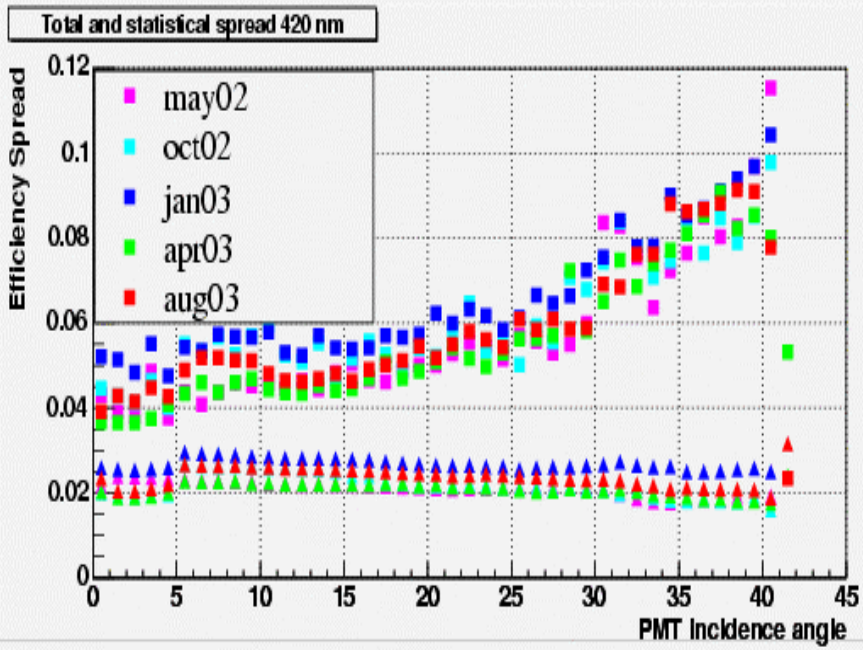

PMT Efficiency Variability 365 nm
Efficiency Spread
PMT Incidence angle

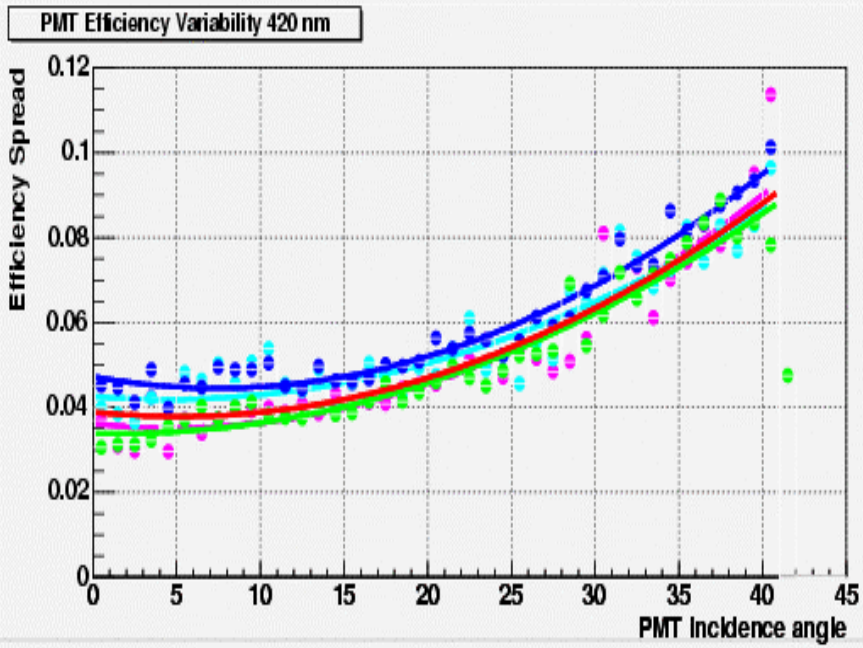
386 nm


Total and statistical spread 386 nm
Efficiency Spread
PMT Incidence angle
may02
oct02
jan03
apr03
aug03


PMT Efficiency Variability 386 nm
Efficiency Spread
PMT Incidence angle

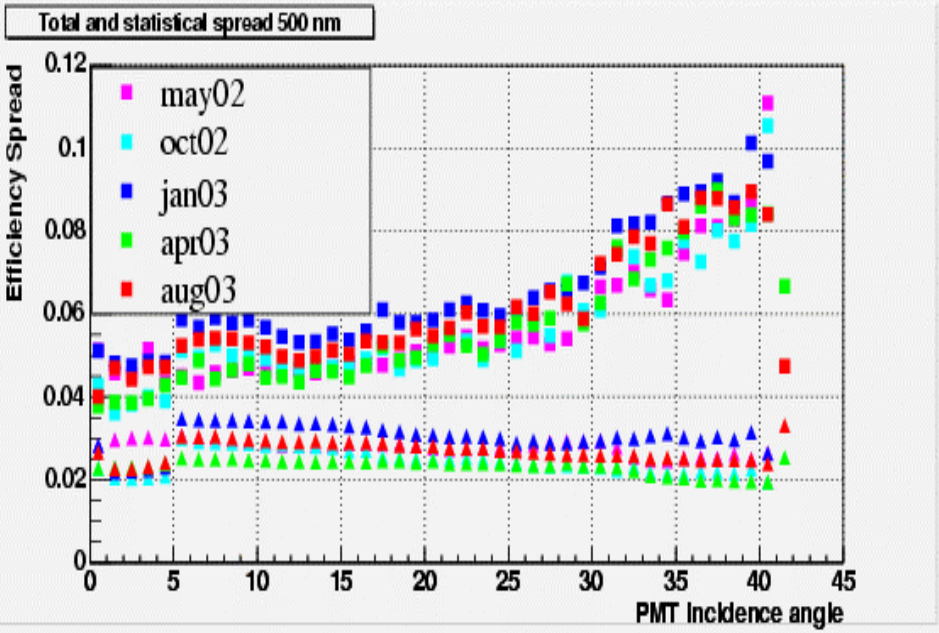
420 nm

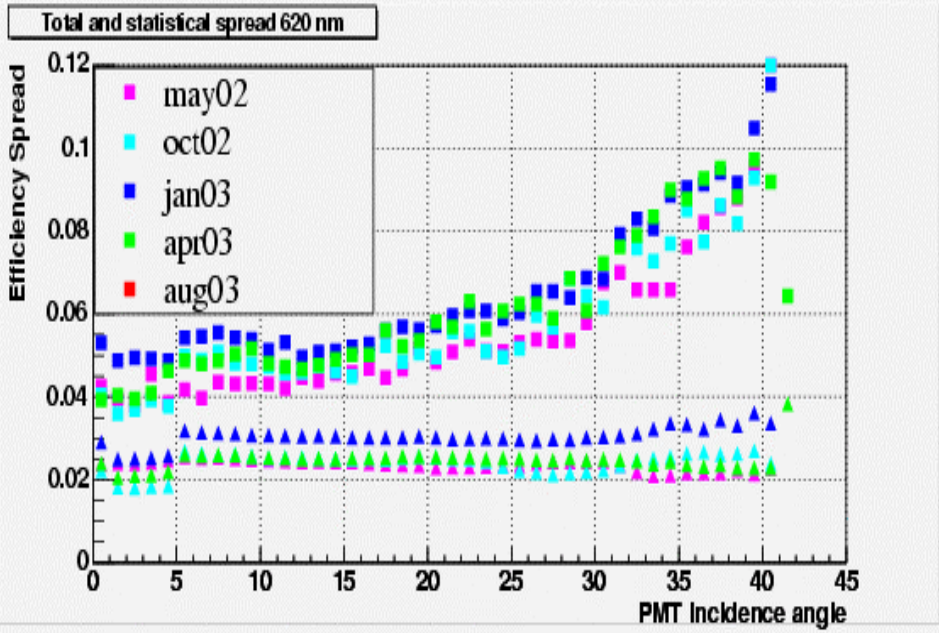

Total and statistical spread 420 nm
Efficiency Spread
PMT Incidence angle
may02
oct02
jan03
apr03
aug03

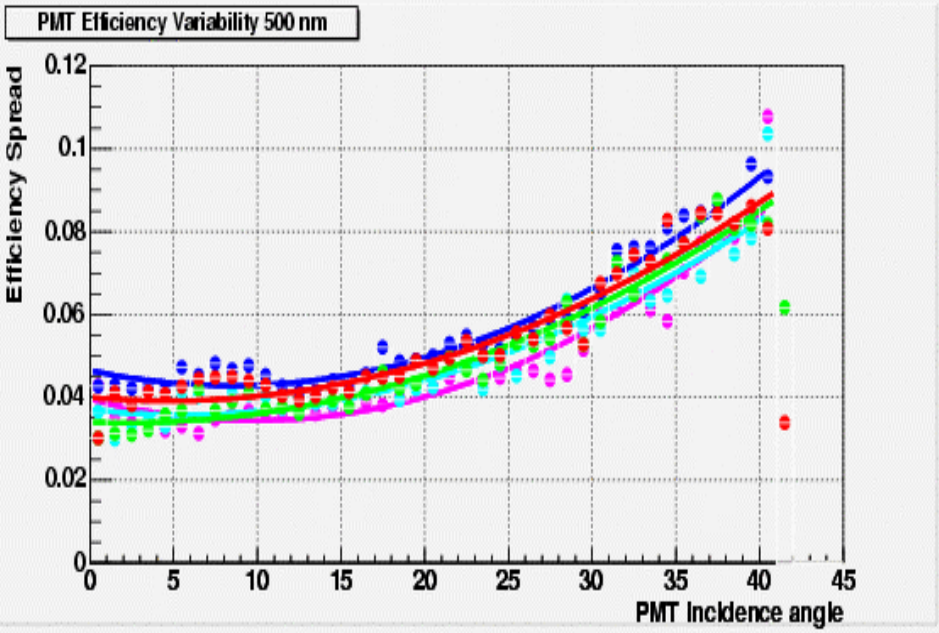

PMT Efficiency Variability 420 nm
Efficiency Spread
PMT Incidence angle

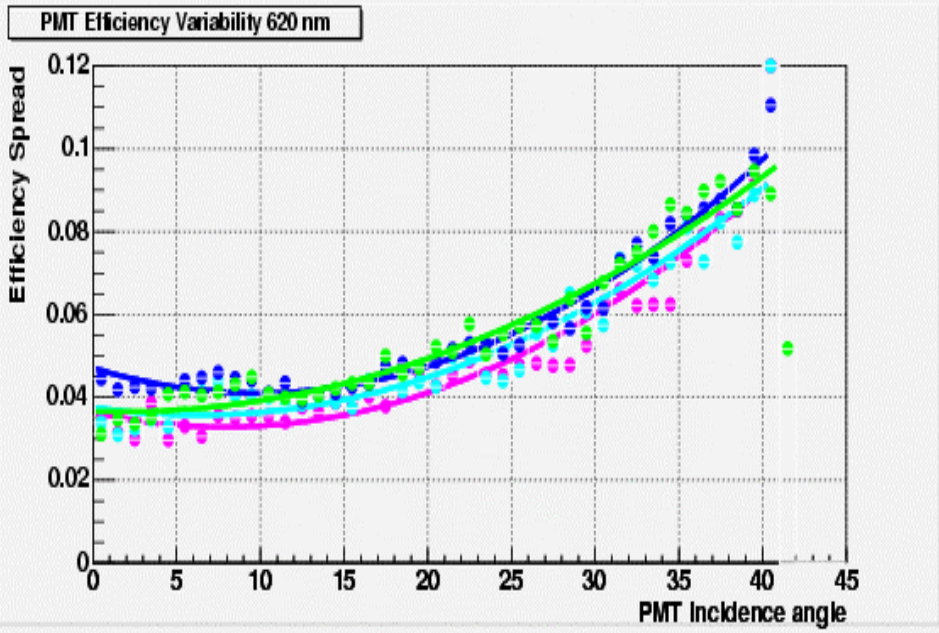
500 nm

620 nm


Total and statistical spread 500 nm
Efficiency Spread
PMT Incidence angle
may02
oct02
jan03
apr03
aug03

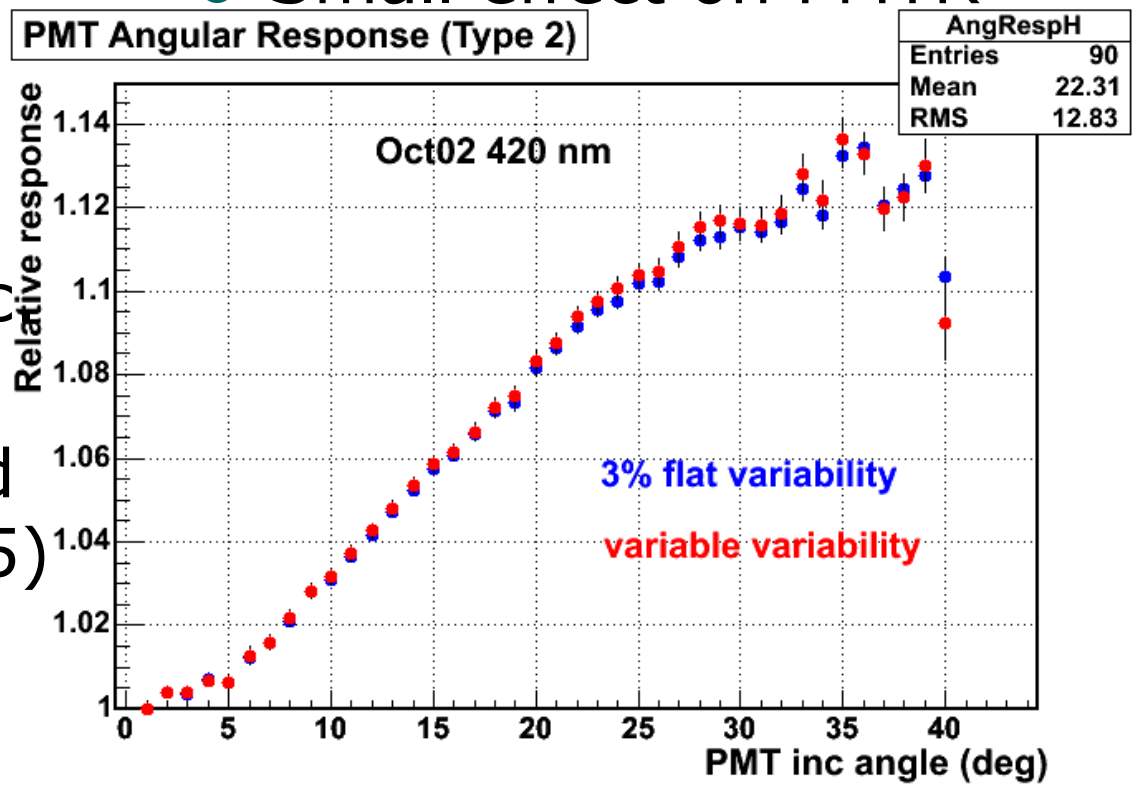

Total and statistical spread 620 nm
Efficiency Spread
PMT Incidence angle
may02
oct02
jan03
apr03
aug03


PMT Efficiency Variability 500 nm
Efficiency Spread
PMT Incidence angle


PMT Efficiency Variability 620 nm
Efficiency Spread
PMT Incidence angle

QOCAFit tests

- Added salt variability function
- Tested with oct02 scan
- Flat pulls on inc angle
- Overall reduced χ^2<1 (was ~1.5)
- Almost no effect on attenuations
- Small effect on PMTR

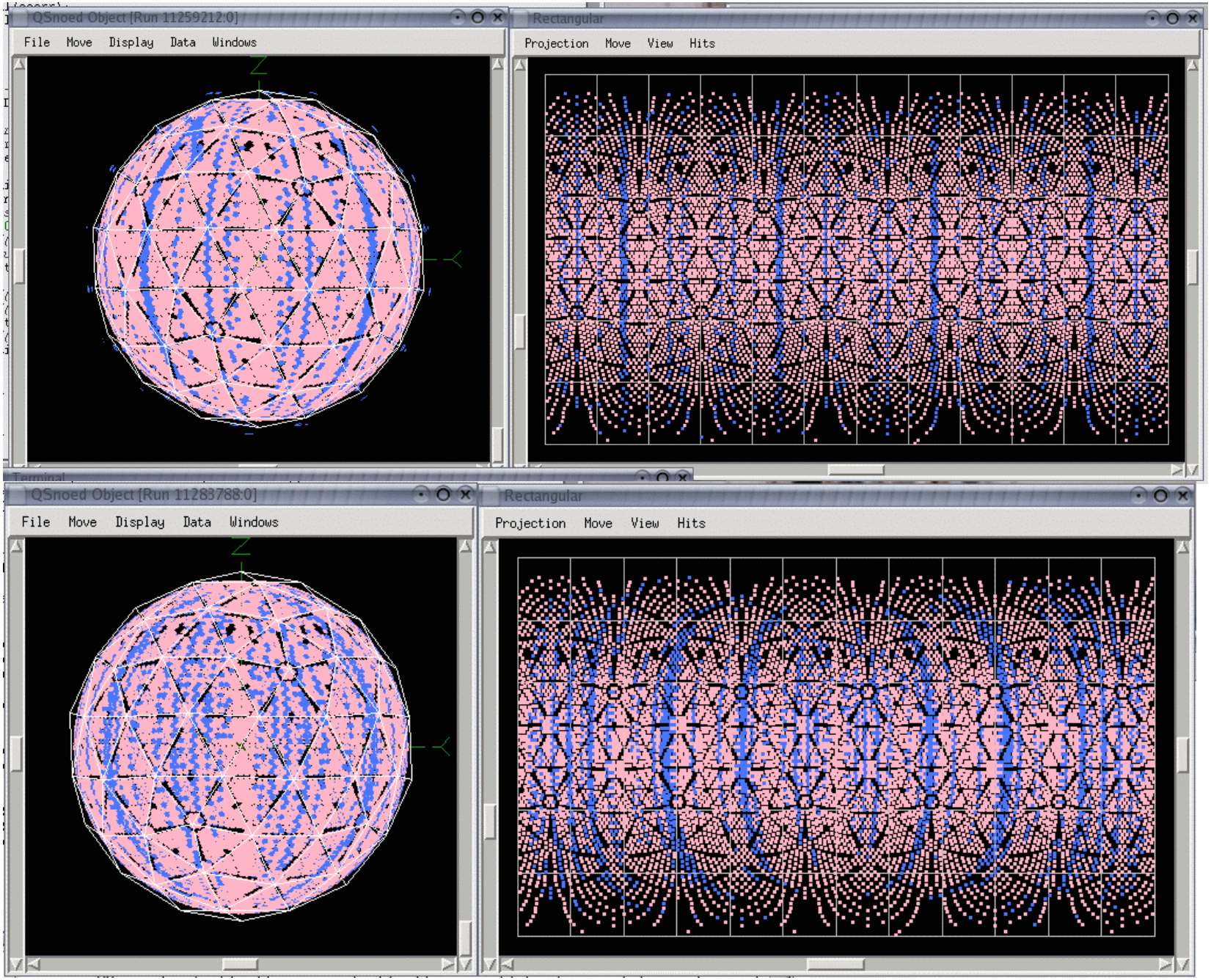


Laserball in SNOMAN

- Point-like source is not good enough for NCD shadow and other studies
- Code added implementing physical radius and weakly peaked angle of emission (~ cos θ)
  - Hopefully in snoman 4_0286
- Assymetries from QOCAFit not yet in
- Used to generate a MC laser scan by Kevin

NCD mask function

- Necessary for Optics fits (but maybe also RSP)
- Conservatively throw out every tube even partially shadowed, taking laserball radius into account
- Code done in QSNO, starting from Aksel's QNCD classes
  - Some debugging left to do, but…
  - Should be able to fit laser MC w/ NCDs quite soon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File Move Display Data Windows
Rectangular
Projection Move View Hits
QSnoed Object [Run 11283788:0]
File Move Display Data Windows
Rectangular
Projection Move View Hits