# Electrons vs $\pi^0$ in water Cherenkov

- Use 1KT simulation and fitting
- Use only single ring e-like events
- Polfit finds weak second rings but at higher energies its efficiency drops
- Try to separate electrons from $\pi^0$ on the basis of ring pattern weight=Q/angeff*vxdist per 1 PMT
- Prepare **e** and $p^0$ templates and for each event check which one fits better
- Try it on events which POLFIT cant separate

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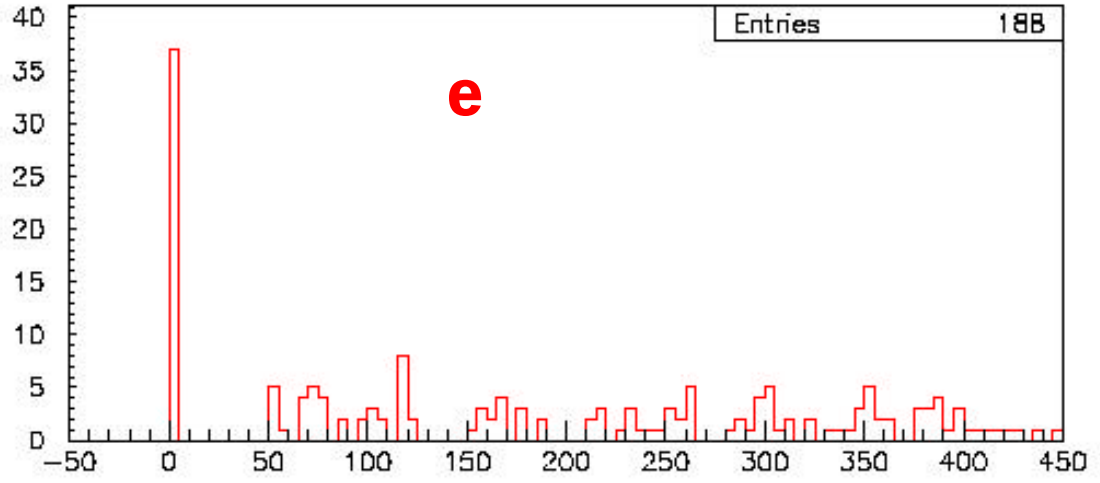
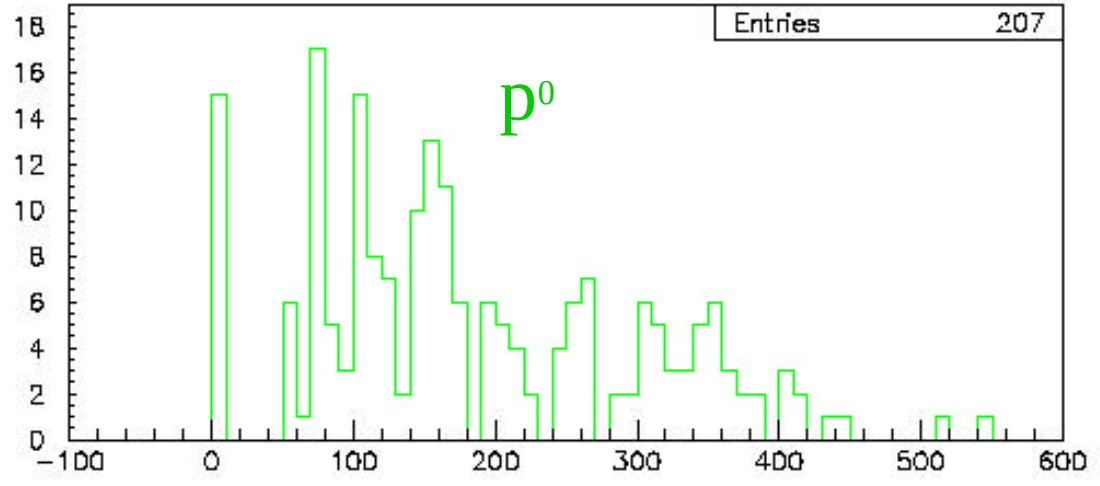
# POLFIT – (version by Mine)




POLFIT
selects events with
mass < 50 MeV:

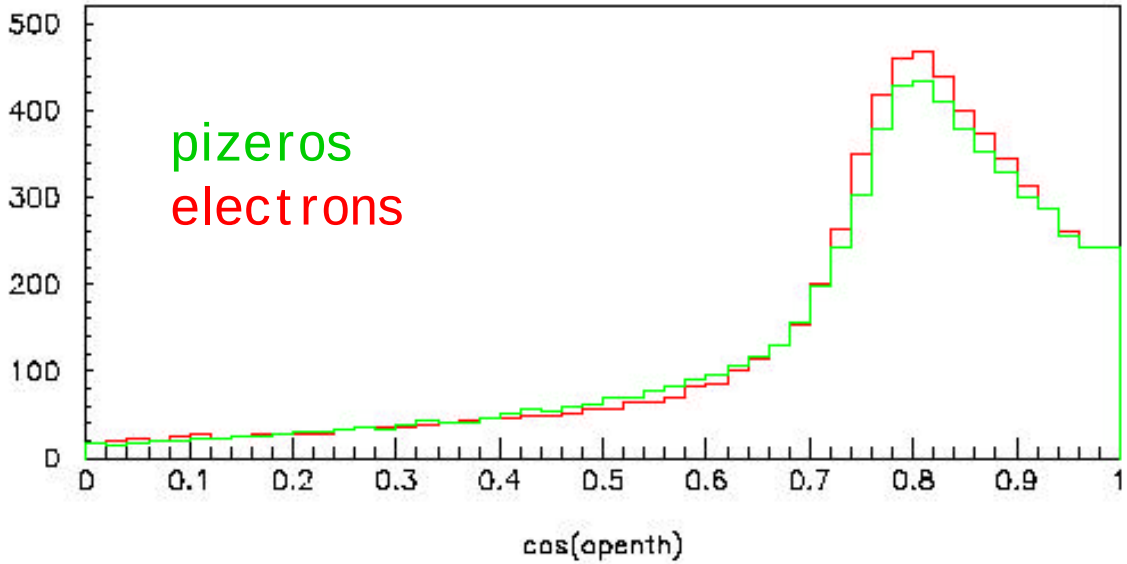
**e 20%**

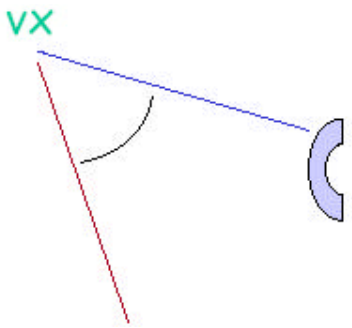
$p^0$ **7%**

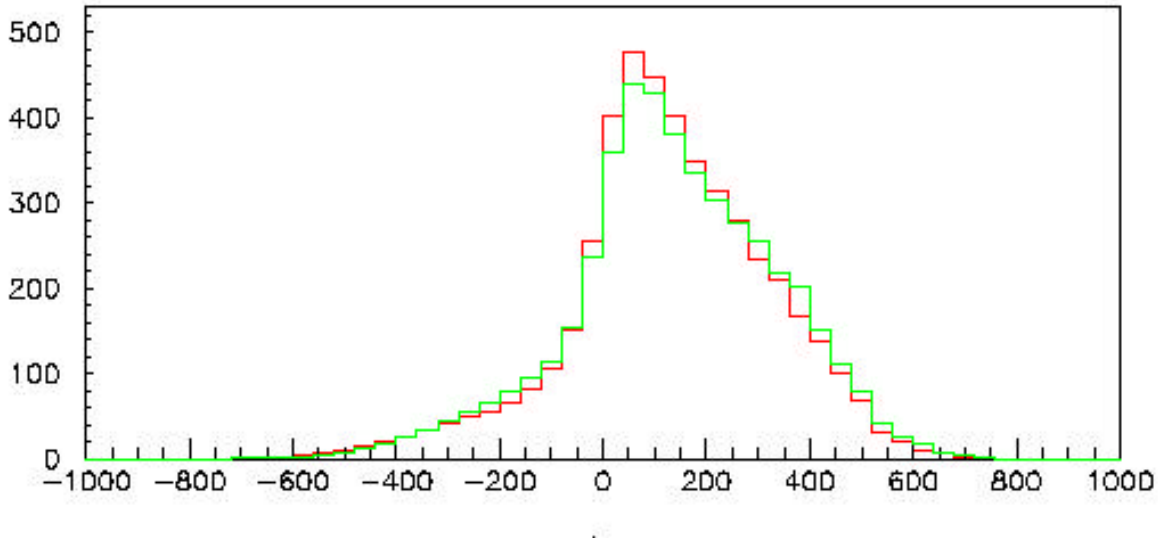
# Template distributions – 1 GeV

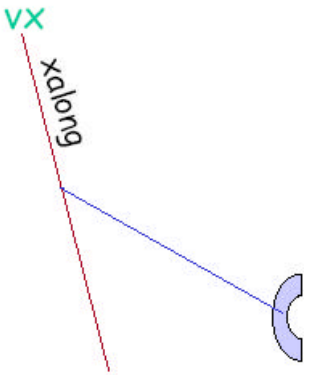
weight=Q/angeff*vxdist per 1 PMT

FC 1 ring e-lik



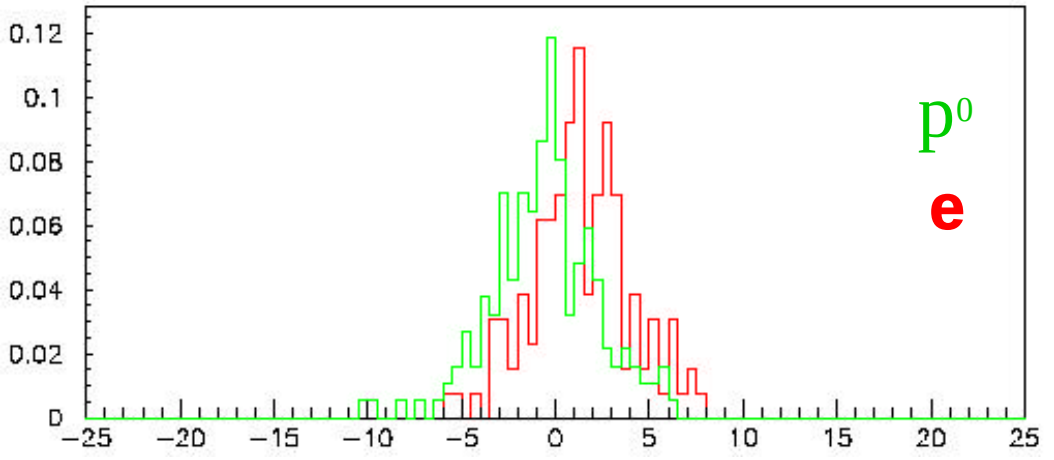



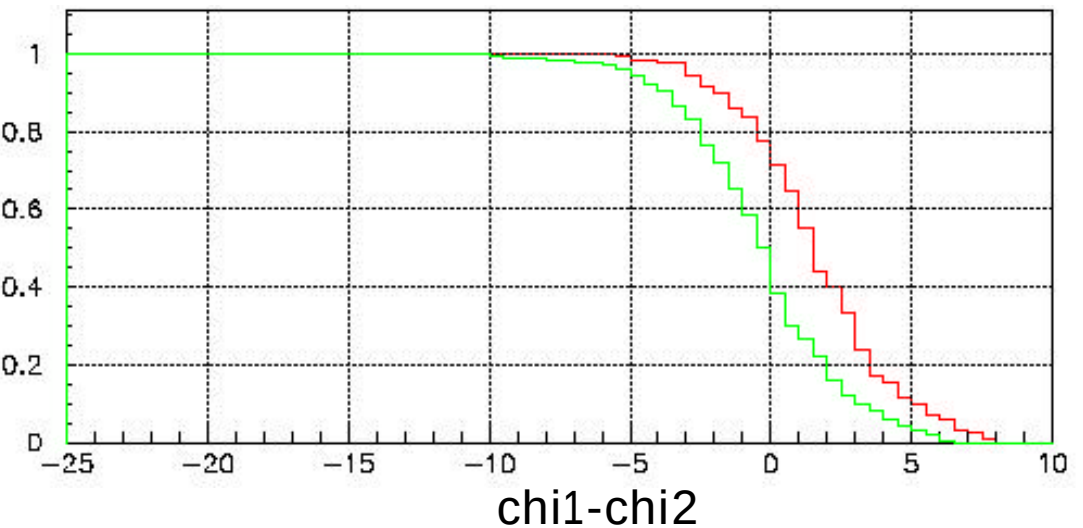



# Difference in log likelihood

for events which POLFIT does not separate (mass>50 MeV):




- small samples
  - ~ 200 events
- here use cos(openangle)

e.g:

for effic= 40% for **e**

one is left with

20% of $p^0$

# Conclusions

- Ring pattern adds discriminant power for events where POLFIT fails

To do:

- Try different energies

  and Super-Kamiokande granularity

- Try „xalong” and other variables