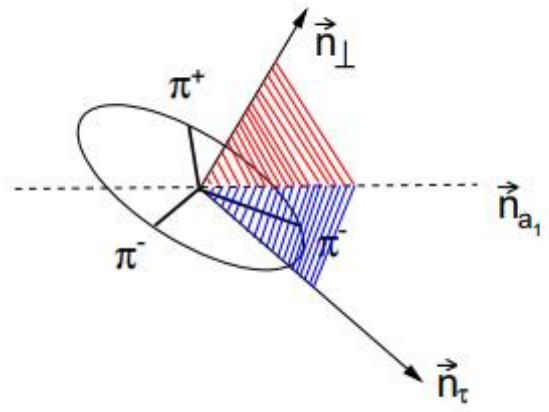
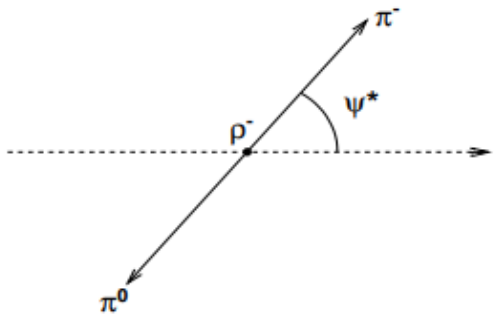
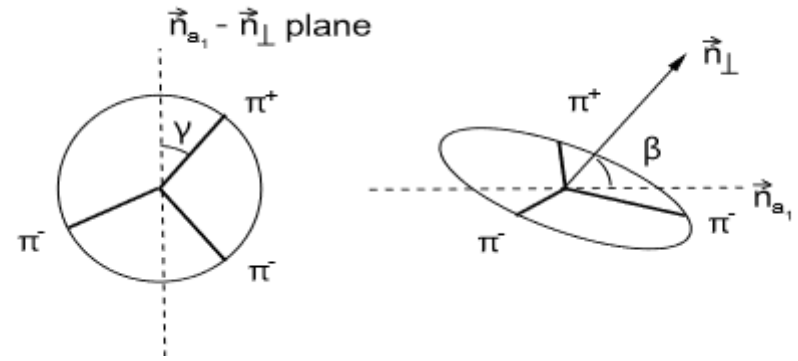
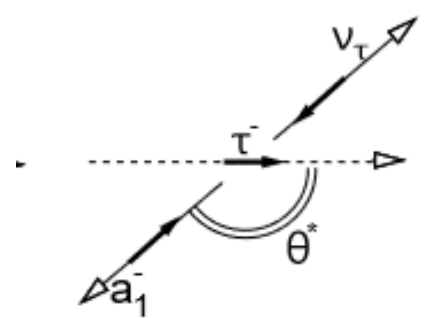


# Optimal observables for tau polarization measurement

Vladimir Cherepanov

Tau helicity state is extracted from angular distributions

There are 4 angles in a1 channel and 3 in rho channel.

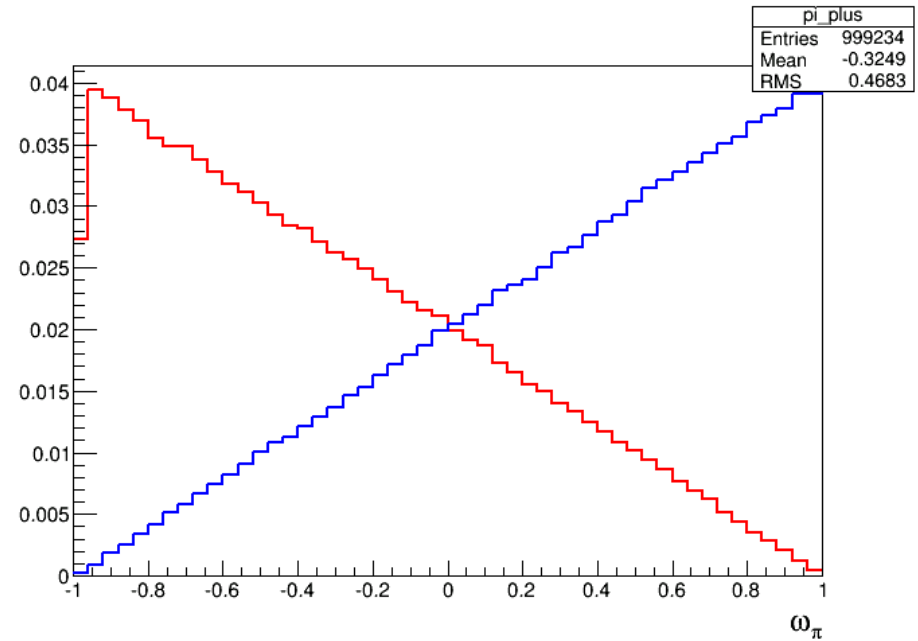


If all angles are reconstructed the sensitivity for any decay is as good as for  $\tau \rightarrow \pi\nu$

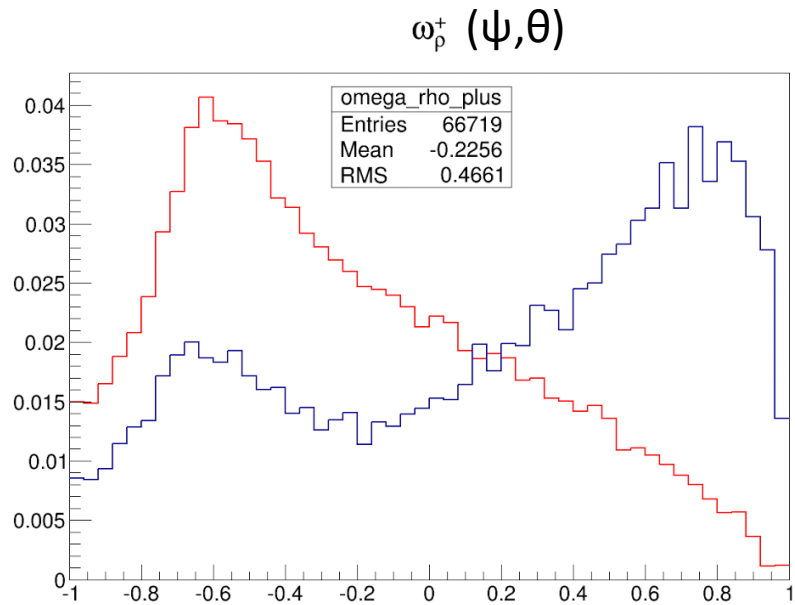
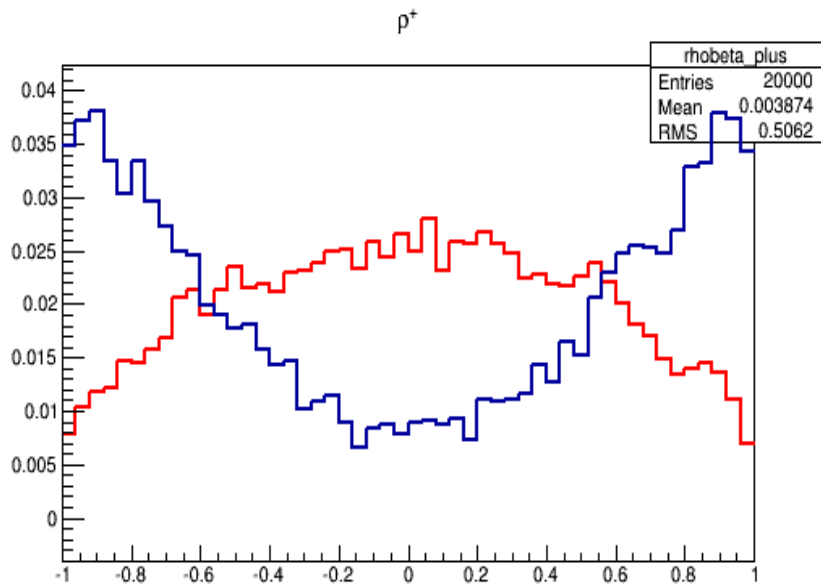
Full kinematic reconstruction: SimpleFits, SVFit

Sensitivity can be further gained combining both tau leptons from Z  $\Omega = \frac{\omega_1 + \omega_2}{1 + \omega_1\omega_2}$

SimpleFits now reconstructs only  $a1+\mu$ , we plan to include all decays  $a1+X$ .



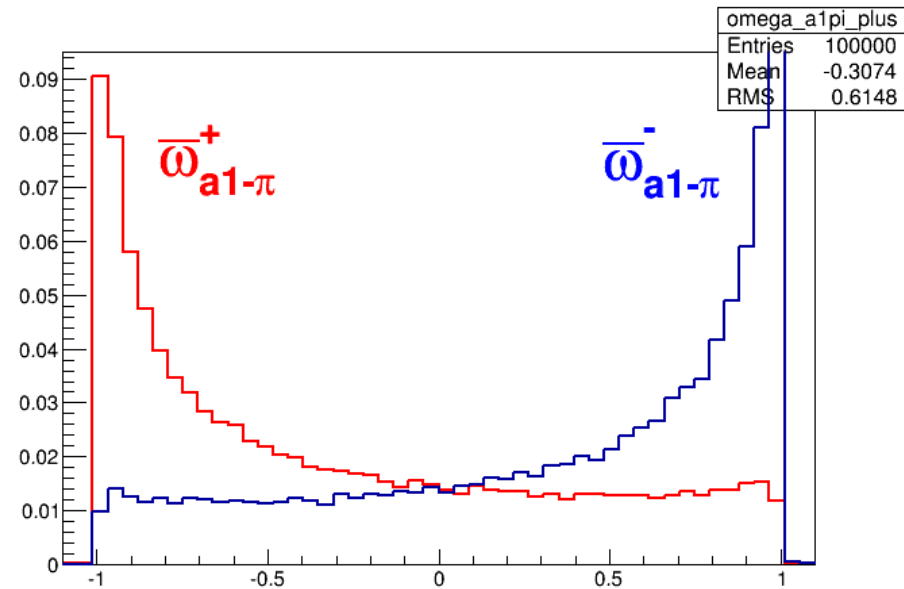
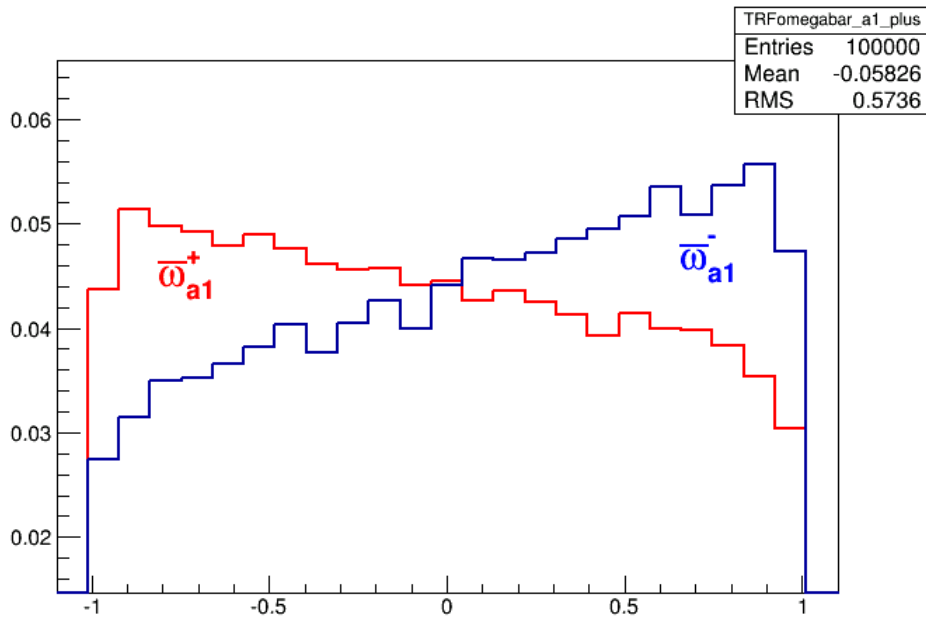
Some example of optimal observable produced using tauola++



$\omega$  for rho decay, using angle  $\psi$  and  $(\psi, \theta)$ .  $(\psi, \theta, \alpha)$  – in progress

$\omega$  for a1 decay, using angle all angles,  
not the right slope at the moment – in  
progress

$\Omega(a1 - \pi)$



The framework to produce optimal observables for all decays and their  
combination will be available soon