

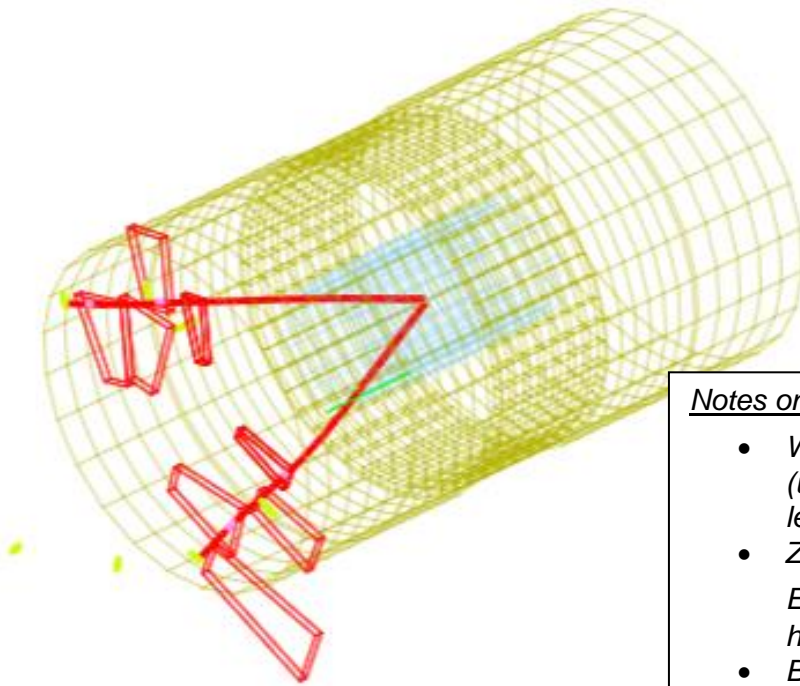


New Questions W-mass “Cheat Sheet”



W and Z boson candidates

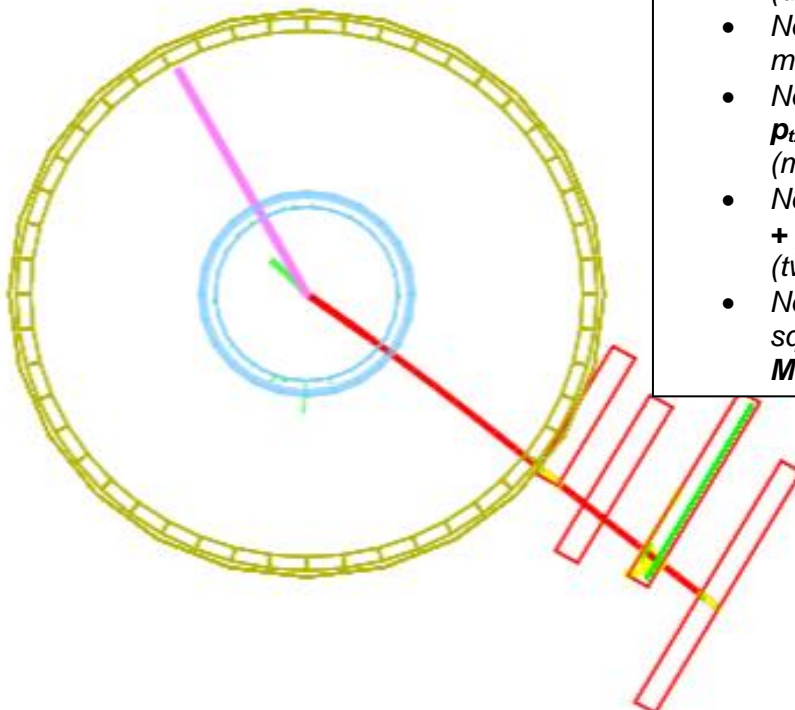
Z decay to muon and anti-muon:



Notes on decays:

- *W decays have missing E_t (usually >20 GeV) and one visible lepton track.*
- *Z decays can show some missing E_t (usually <20 GeV) or none and have 2 visible lepton tracks.*
- *Both W and Z decays can have “extra” tracks which confound quick analysis – but a “good guess” can sometimes be made.*

W decay to muon and neutrino:



Mathematics:

- *Main equation, $E^2 = p^2 c^2 + m^2 c^4$ (do not worry about the c's.)*
- *Net energy, $E = E_1 + E_2$ (two muons)*
- *Net transverse energy, $E_t = p_{t1} + p_{t2}$ (two muons) or $E_t = p_{t1} + MET$ (muon and neutrino)*
- *Net momentum squared, $P^2 = (p_{x1} + p_{x2})^2 + (p_{y1} + p_{y2})^2 + (p_{z1} + p_{z2})^2$ (two muons)*
- *Net transverse momentum squared, $P_t^2 = (p_x + MET_x)^2 + (p_y + MET_y)^2$ (muon and neutrino)*