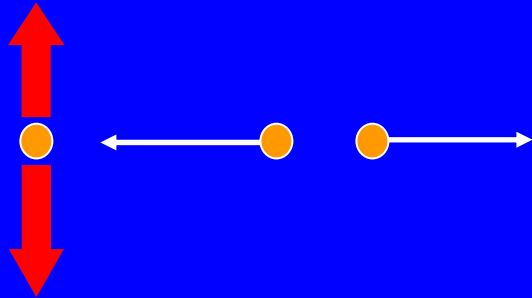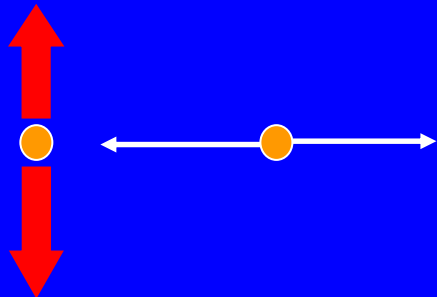# QUARTIC Background Rejection (UTA)

1) 2 single diffractive protons overlayed with a hard scatter (1% of interactions have a proton at 420m)
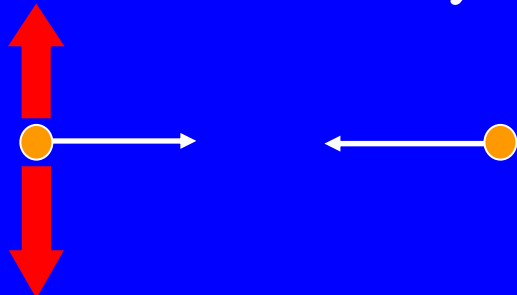
97.4% of events primary vertex and fake vertex from combining proton times more than 2.1mm (1σ) apart ; 94.8% if 20 psec

2) double pomeron overlayed with a hard scatter

97.8% of time vertices more than 2.1mm apart; 95.6% if 20 psec

3) hard SD overlayed with a soft SD

95.5% of time primary vertex and fake vertex more than 2.1mm apart; 91.0% if 20 psec

Background Rejection

- Big issue is fake background, not multiple proton background, we (I) do not know absolute magnitudes
- What I think is needed: generate inclusive SD +DPE (Phojet, other), Hard SD (Pomwig/other), inclusive Higgs (no protons Herwig/Pythia), SD Higgs (Pomwig/other)
- Track protons to 420m
- Apply kinematic constraints, comparison of missing mass to central mass, apply additional constraints from timing and see to what luminosity FP420 is feasible

This could be showstopper, needs concerted effort/task force