# Plans for Diffractive Analysis Using the Forward Proton Detector

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# Data Sample

- Data for the dipole pots was collected between the January shutdown to the September shutdown.
- Data was read out for every event but there were also diffractive gap triggers for Jet 15, Jet 25, Jet 45 and a few special runs
- Currently in the process of determining all runs during this period for which the dipole pots were inserted (~50% of the total) and recording the various different running conditions
- Will apply good runs lists (Calorimeter, CFT, etc) and any other suggested criteria to reduce the sample size
- Estimate around 50 $pb^{-1}$ of data

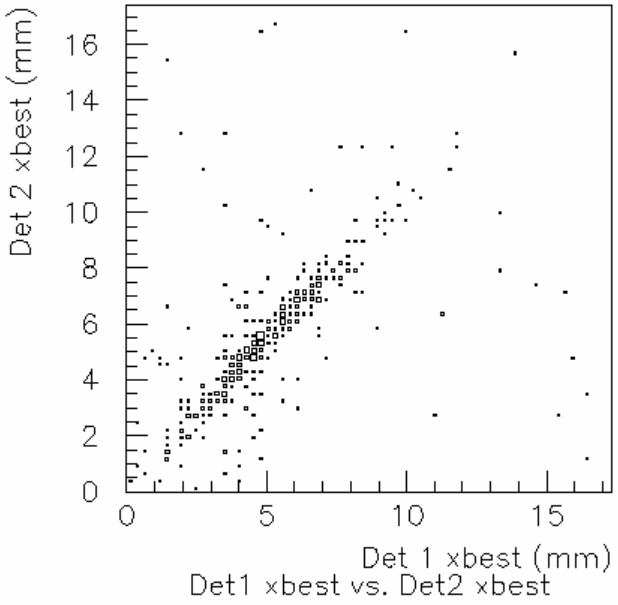
# Data Reconstruction

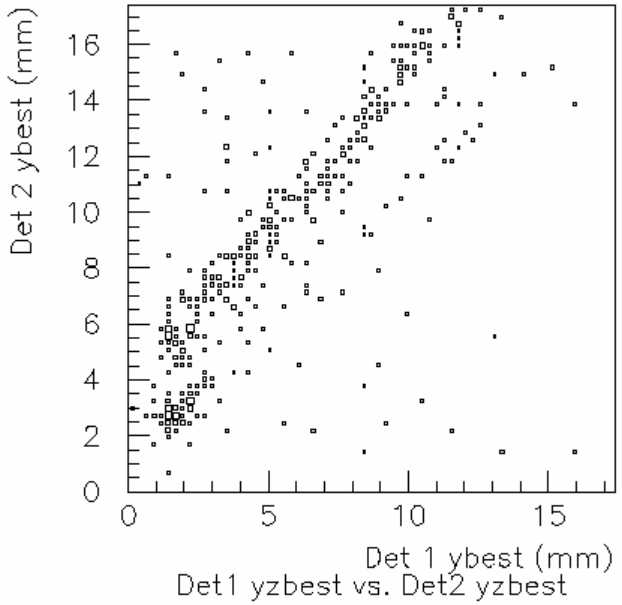
- Using final run list, will need to use p14.06 version of d0reco which includes fpd_unpack to reprocess the runs into special FPD DSTs that include the FPDDigiChunk (raw ADC information)
  - Need to determine a subset of triggers to reconstruct
- Currently trying to get a version of TMB created that will pass the FPDDigiChunk directly to the TMB format for special FPD TMBs
- Can use existing QCD tools to get TMBs into roottuple for analysis
- Need to explore where to run the reprocessing (UTA, Manchester?) as it is too big of a job to run on CAB
  - How to transfer raw data and get access to databases?
  - Renata from Brazil will be responsible to overlooking the job and making sure it runs as expected

# Hit Definition

- First task with reconstructed code is to determine the method to find a hit in the detector.
  - Job of the FPD tracking sub-group
- Have access to calibration data of the AFE board for pedestal mean and rms
- Need to define discrimination level
- Need to explore various levels of cross talk
- Need to explore various levels of multiplicity
- Have experience in doing this on old standalone data, need to convert tools to standard form

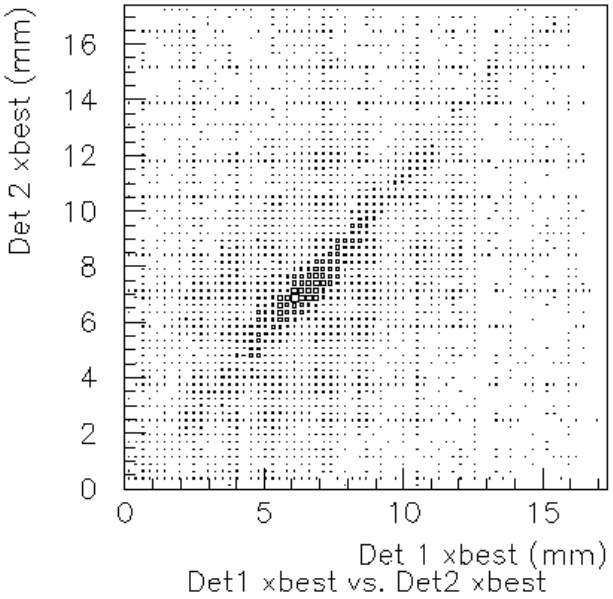
# JT_25TT_GapN and Special Run

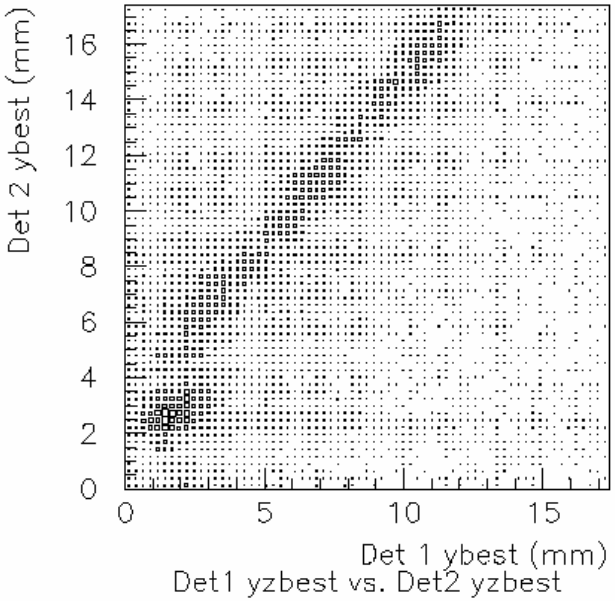



- Uses trigger:
  - one jet with 25GeV and North luminosity counters not firing
- Similar correlations
- Jet requirement suppresses proton halo
- This is only a small sample

- Uses similar trigger to standalone but only last bunch of super bunch
- Similar correlations
- Last bunch of super bunch has no proton halo
- Sample used to get $\xi$ and $t$ distributions



# FPD_reco

- Need to take hits and apply alignment corrections at the detector plane level
- Process through multi-hit fpd_reco
- Determine any alignment corrections for spectrometer
- Calculate $\xi$ and $t$ distributions for the sample
  - Should be available on a Moriond scale
- Study backgrounds to the hits signal from halo
- MC studies
  - Needs to be generated through Manchester group

# Measurements using Jets

- Study jet characteristics in for events that have tags compared to those that don't
  - Available on Moriond timescale
- Study diffractive rates
- Measure ratio of diffractive dijets to non-diffractive relative to $\xi$ and $t$ in order to probe the Pomeron structure function
  - Available on summer timescale

Extensions to Analysis beyond my time

- Look at jet cross section with respect to $\xi$ and $t$
- Compare to results using the gap definition