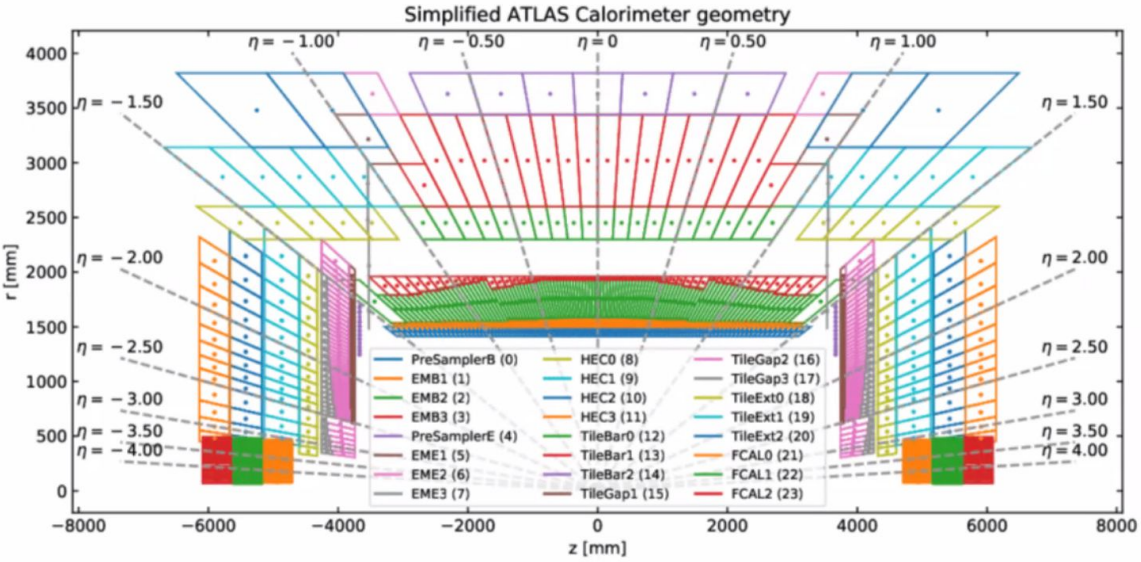
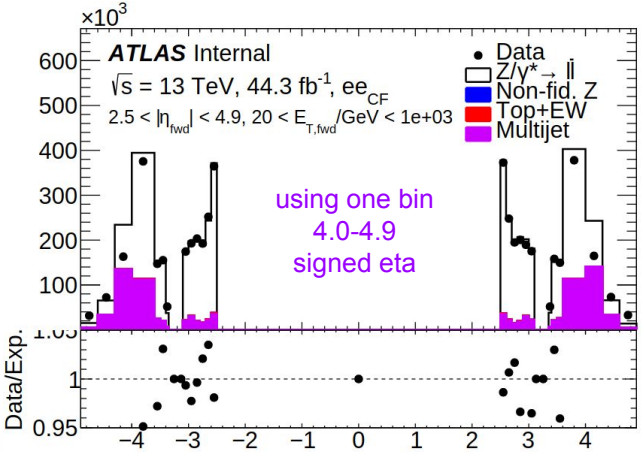
# ZAi Analysis in eeCF channel

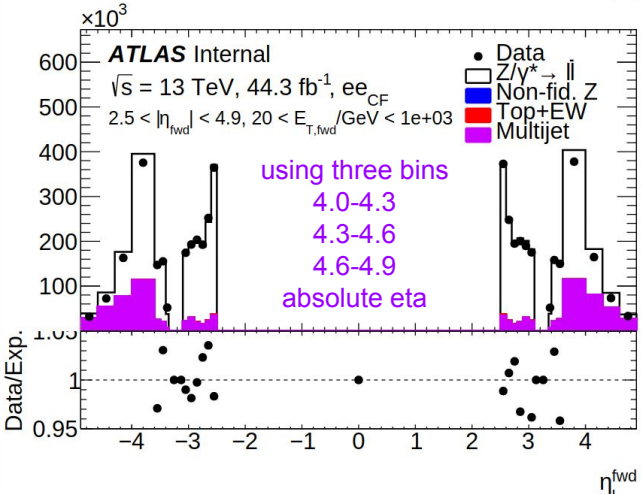
## multijet estimation with fake factor method

$$N_{\mathrm{MJ}}^{\mathrm{SR}} = F N_{\mathrm{MJ}}^{\mathrm{CR}} = \tilde{N}_{\mathrm{MJ}}^{\mathrm{CR}} = \tilde{N}_{\mathrm{data}}^{\mathrm{CR}} - \hat{\mu}\tilde{N}_{\mathrm{MC}}^{\mathrm{CR}}$$

$$F = \frac{N_{\mathrm{MJ}}^{\mathrm{IDoff}}}{N_{\mathrm{MJ}}^{\mathrm{nLoff}}} \qquad \hat{\mu} = \frac{N_{\mathrm{prompt}}^{\mathrm{SR}}}{N_{\mathrm{MC}}^{\mathrm{SR}}} = \frac{N_{\mathrm{data}}^{\mathrm{SR}} - \tilde{N}_{\mathrm{data}}^{\mathrm{CR}}}{N_{\mathrm{MC}}^{\mathrm{SR}} - \tilde{N}_{\mathrm{MC}}^{\mathrm{CR}}}$$



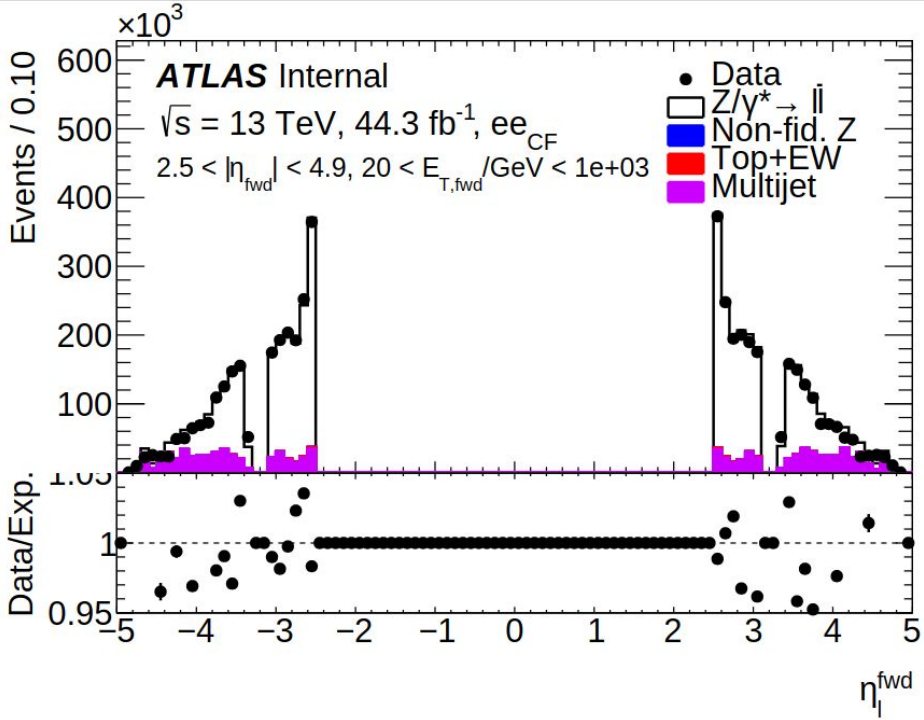



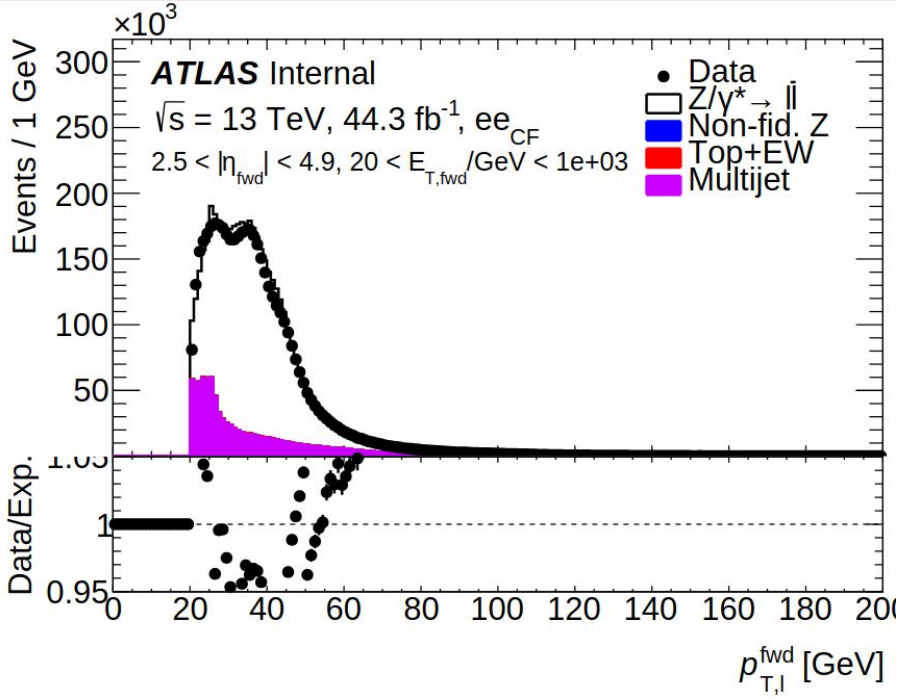



# ZAi Analysis in eeCF channel

multijet estimation with fake factor method

most recent multijet estimates (displayed with fine binning)

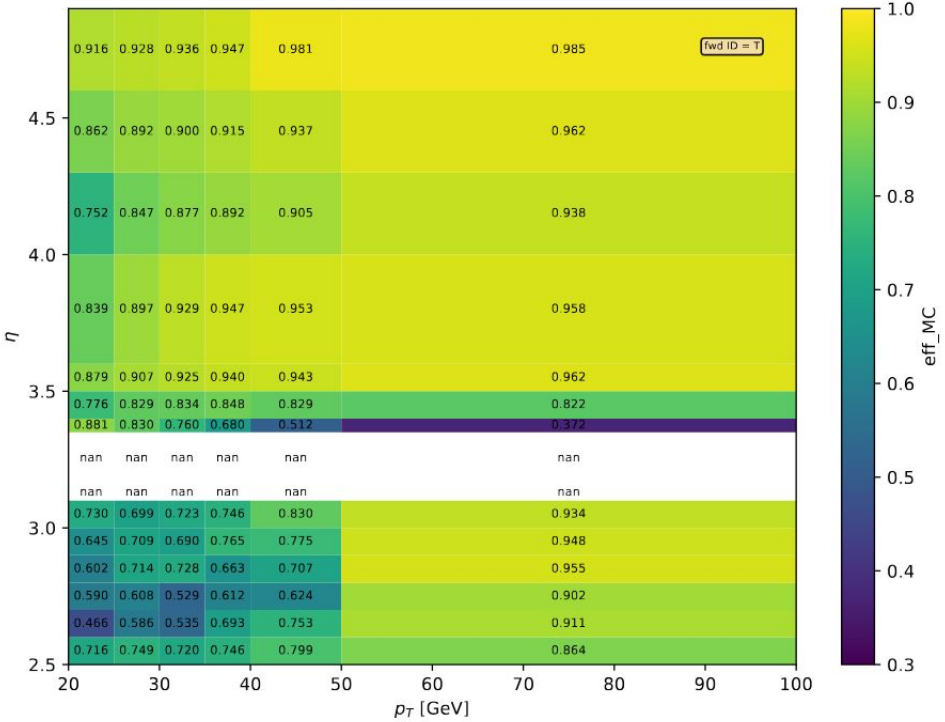


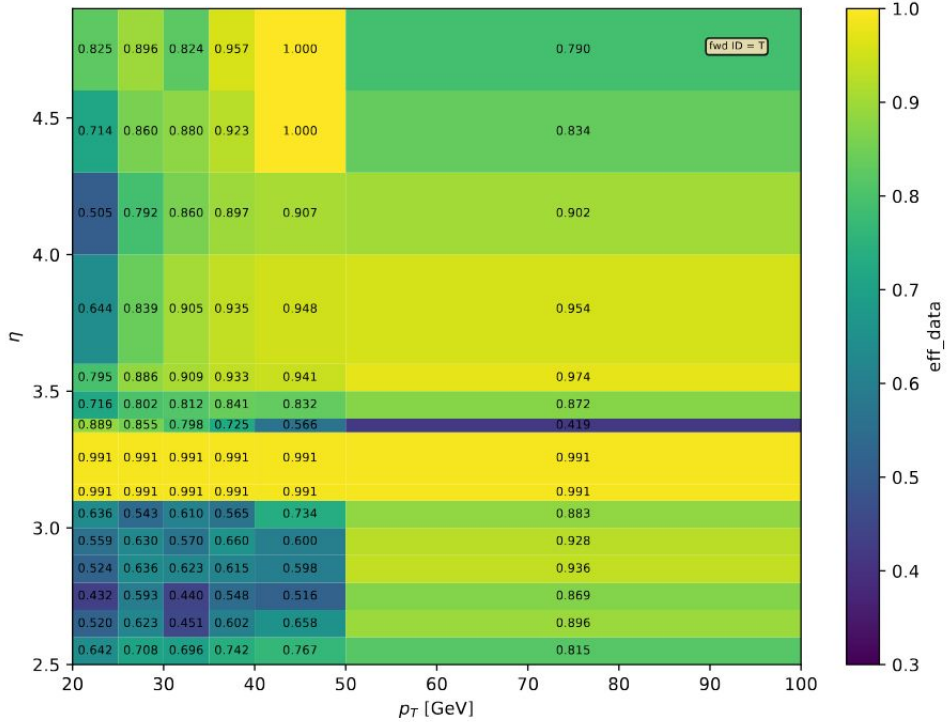
# ZAi Analysis in eeCF channel

## electron identification-efficiency tight

### Monte-Carlo

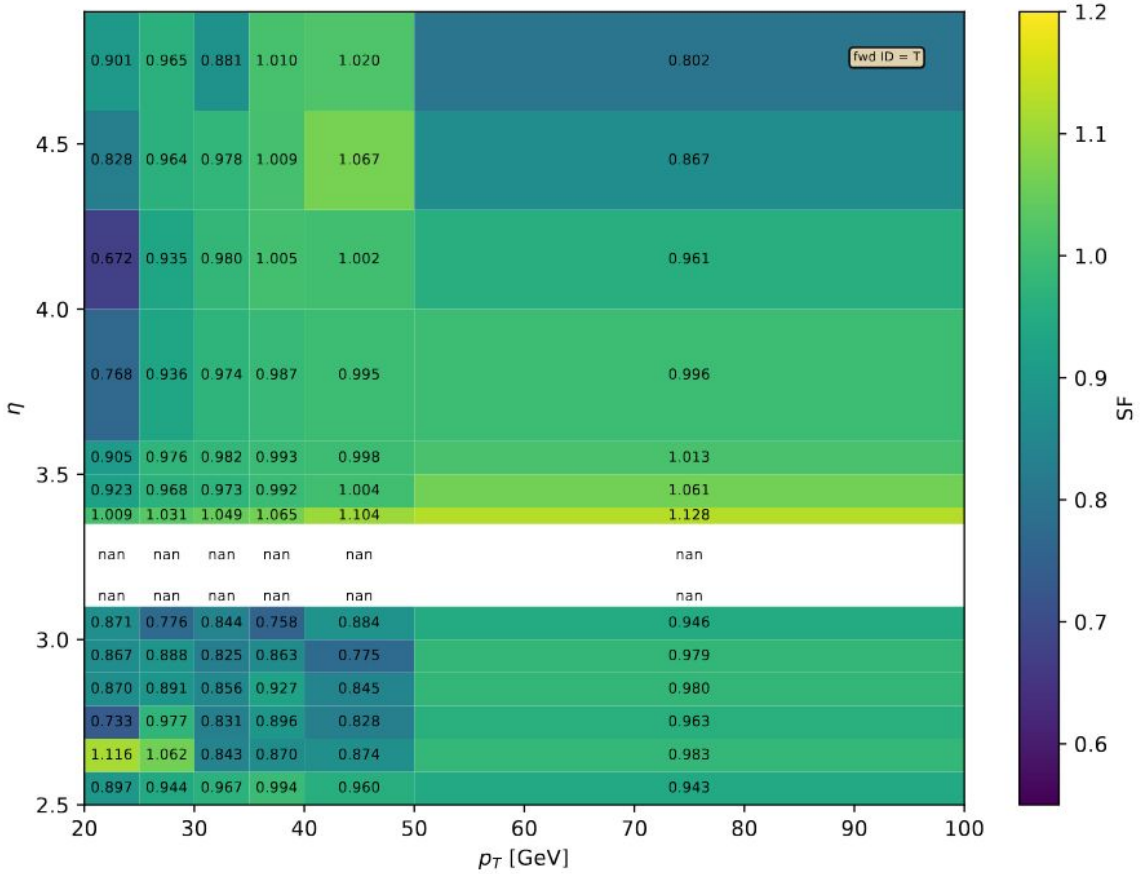



### Data



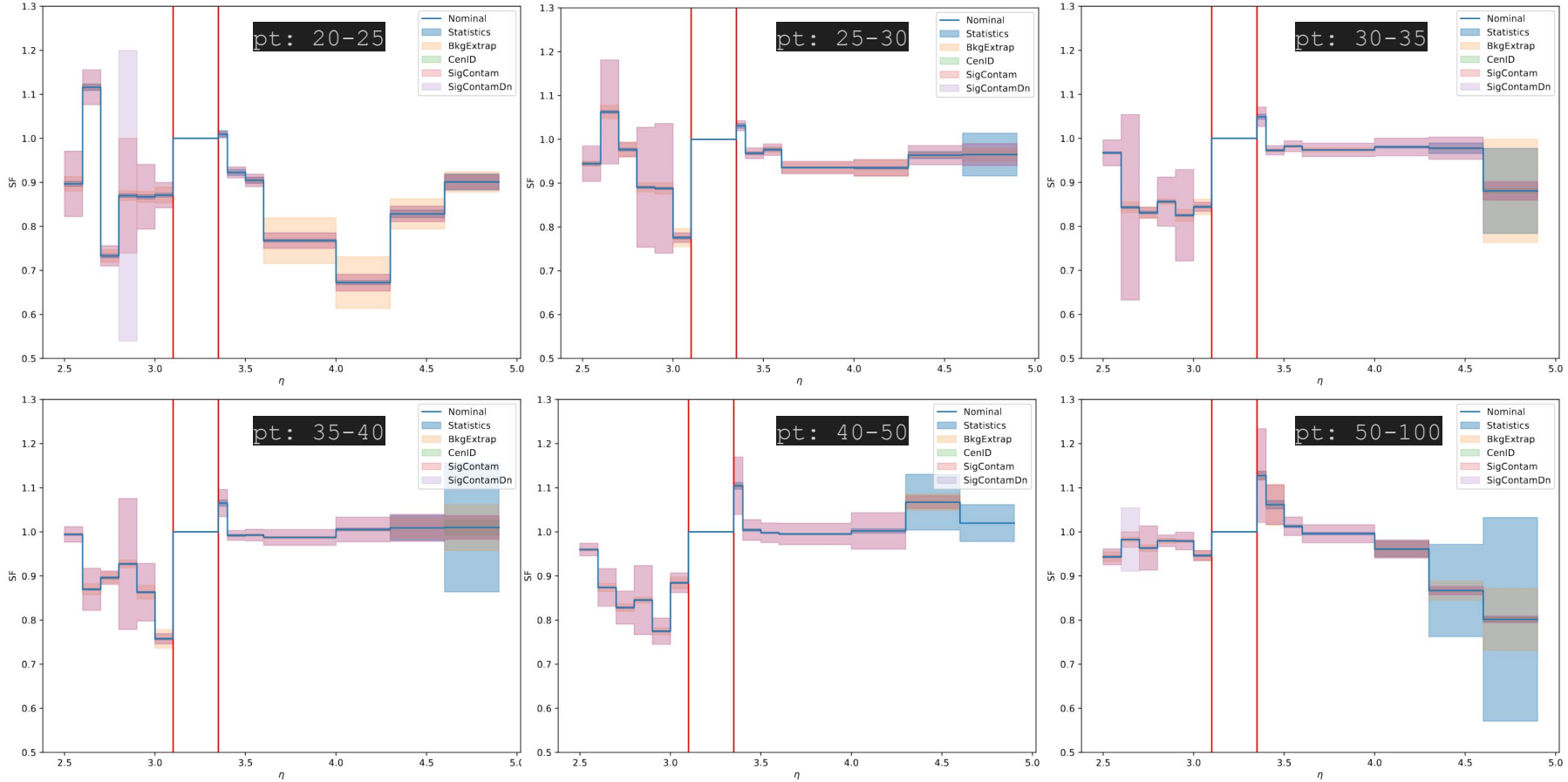
# ZAi Analysis in eeCF channel

## electron identification-efficiency scale-factors



# ZAi Analysis in eeCF channel

## electron identification-efficiency scale-factors



# fwdID SFs systematics

| variation | nID | cenID | ineffSF |
|---|---|---|---|
| Nominal | nVVL | TIC | 1 |
| CenID | nVVL | MC | 1 |
| BkgExtrap | nVL | TIC | 1 |
| SigContam | nVVL | TIC | 2 |
| SigContamDn | nVVL | TIC | 0 |
| BkgShape | we decided not to use this, because we don’t understand it (yet) | | |

# ZAi Analysis in eeCF channel

electron identification-efficiency scale-factors

## DONE

- created new FFs for 2017 after Filips changes to trigger and central ID
- created new SFs for 2017 after Filips changes to trigger and central ID
- …now including systematics
- improved FFs in FCAL by splitting the bin and switching to absolute eta
- found CF events with fwdEta < 2.5 causing errors when trying to load FFs
    - fixed by assigning them to the lowest FF bin

## TO-DO

- create FFs for 15/16 and 2018 (need lists and weights from Craig)
- create SFs for 15/16 and 2018 (need lists and weights from Craig)
- create control plots with and without SF application → compare
- (possibly) create SFs with coarser binning for all years → compare to Luxin's results

**the above can run mostly in the background, so is there something else for me to do actively?**
**→ UNDERSTAND aidy / nuisance parameters etc.**