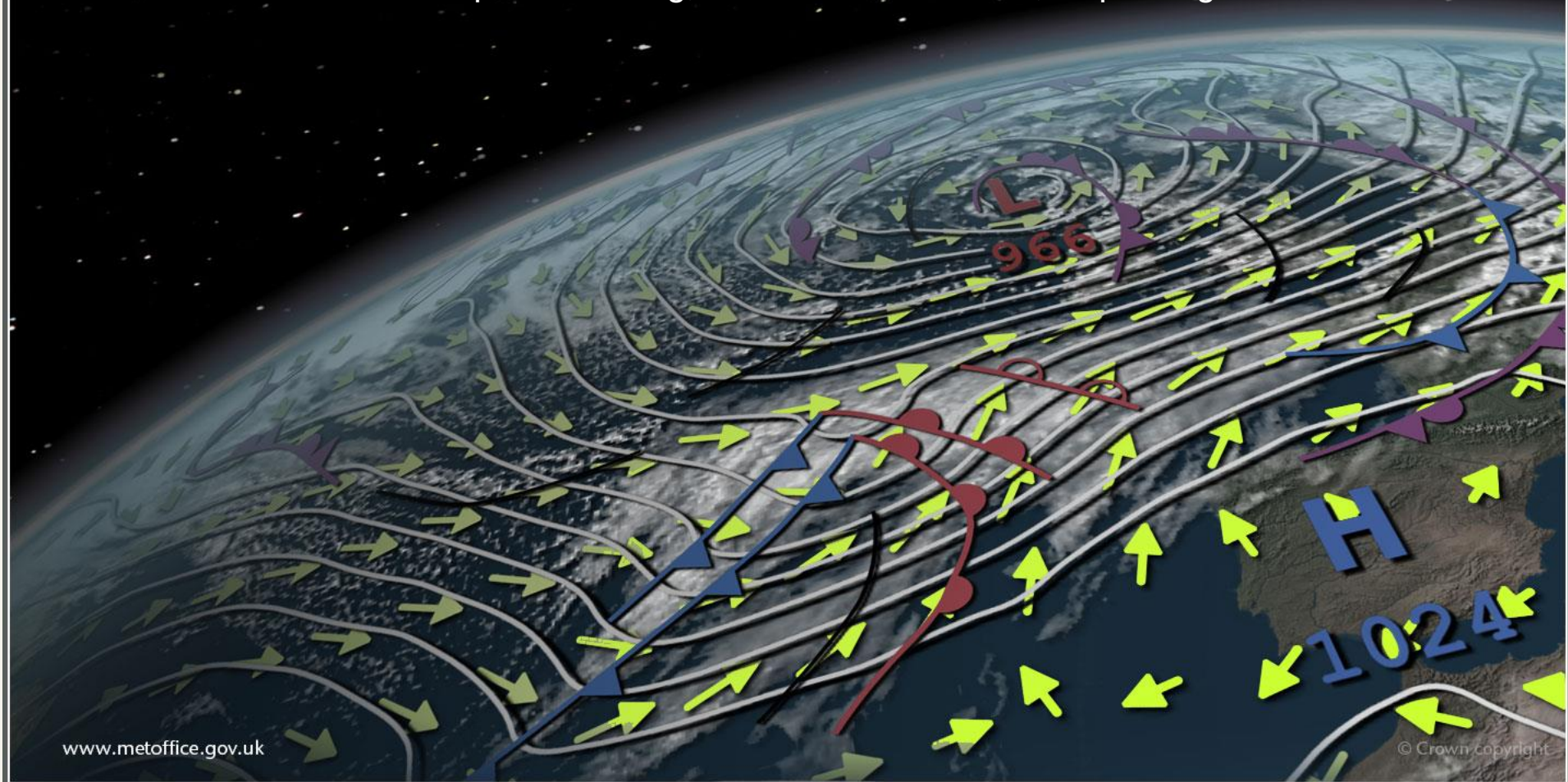




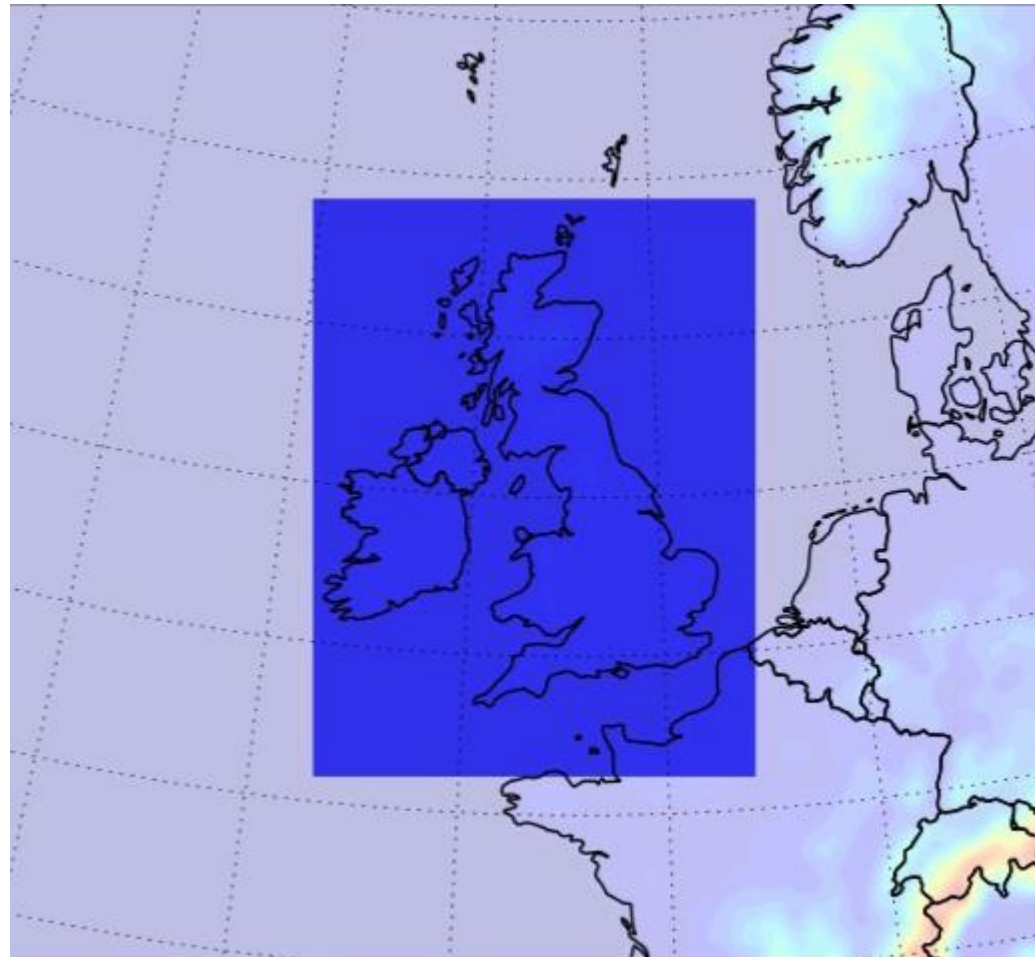
Met Office Assimilation status at the Met Office

Gemma Halloran and Owen Lewis

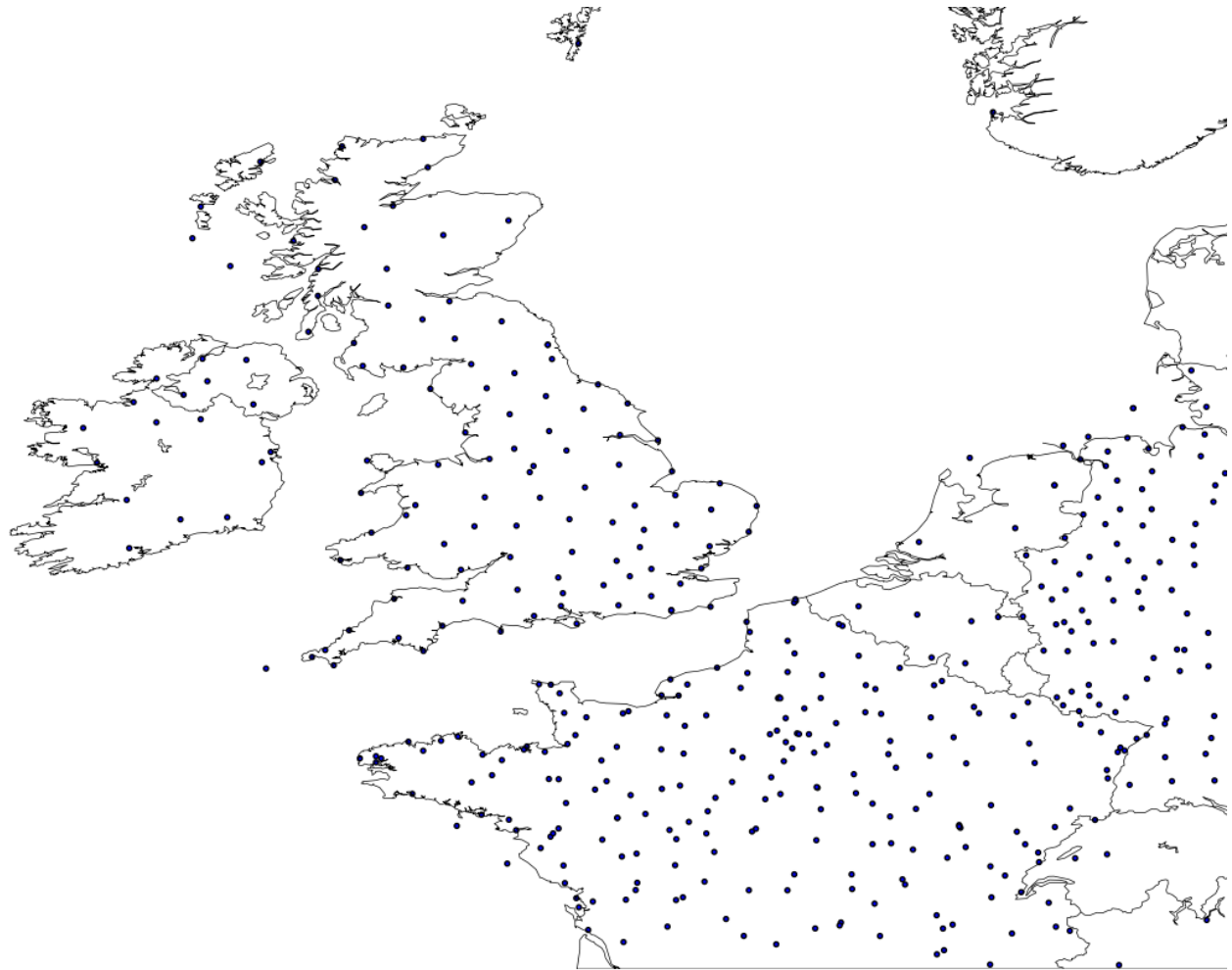
E-GVAP Experts meeting, 6-7th December 2016, Copenhagen



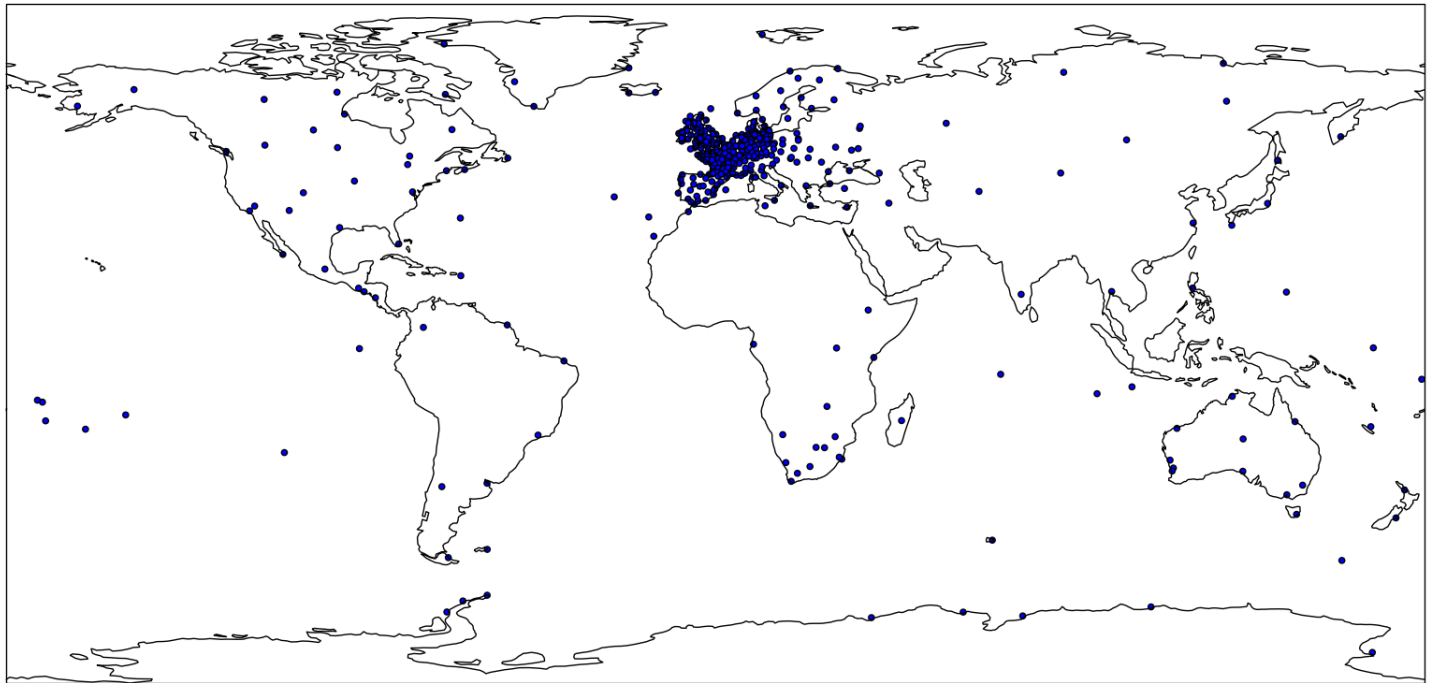
Extended domain regional model



UK model



Global model



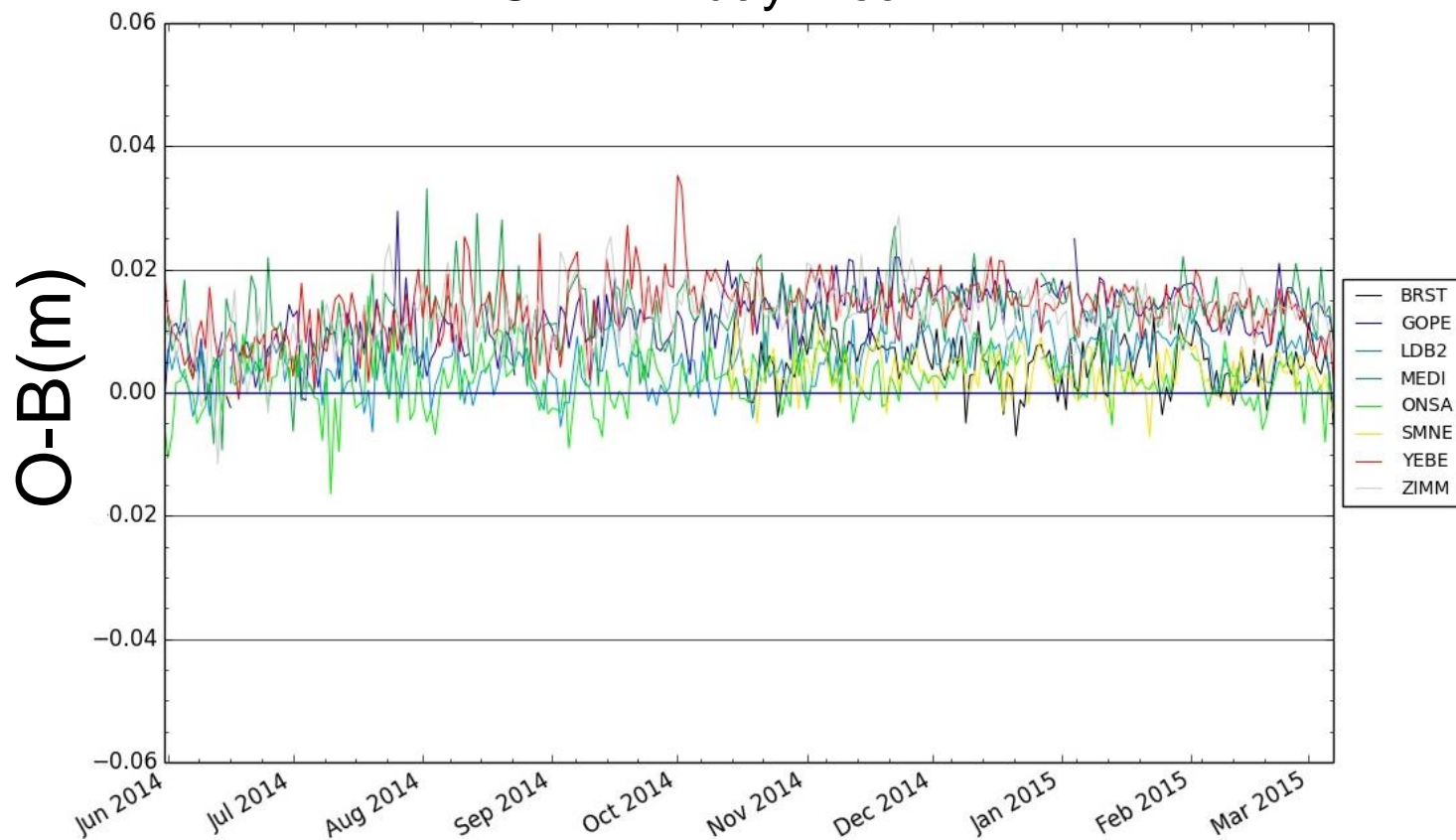
What about biases?

What bias might we want to correct for?

- Processing centre bias
- Site specific bias
- Bias in the observation operator

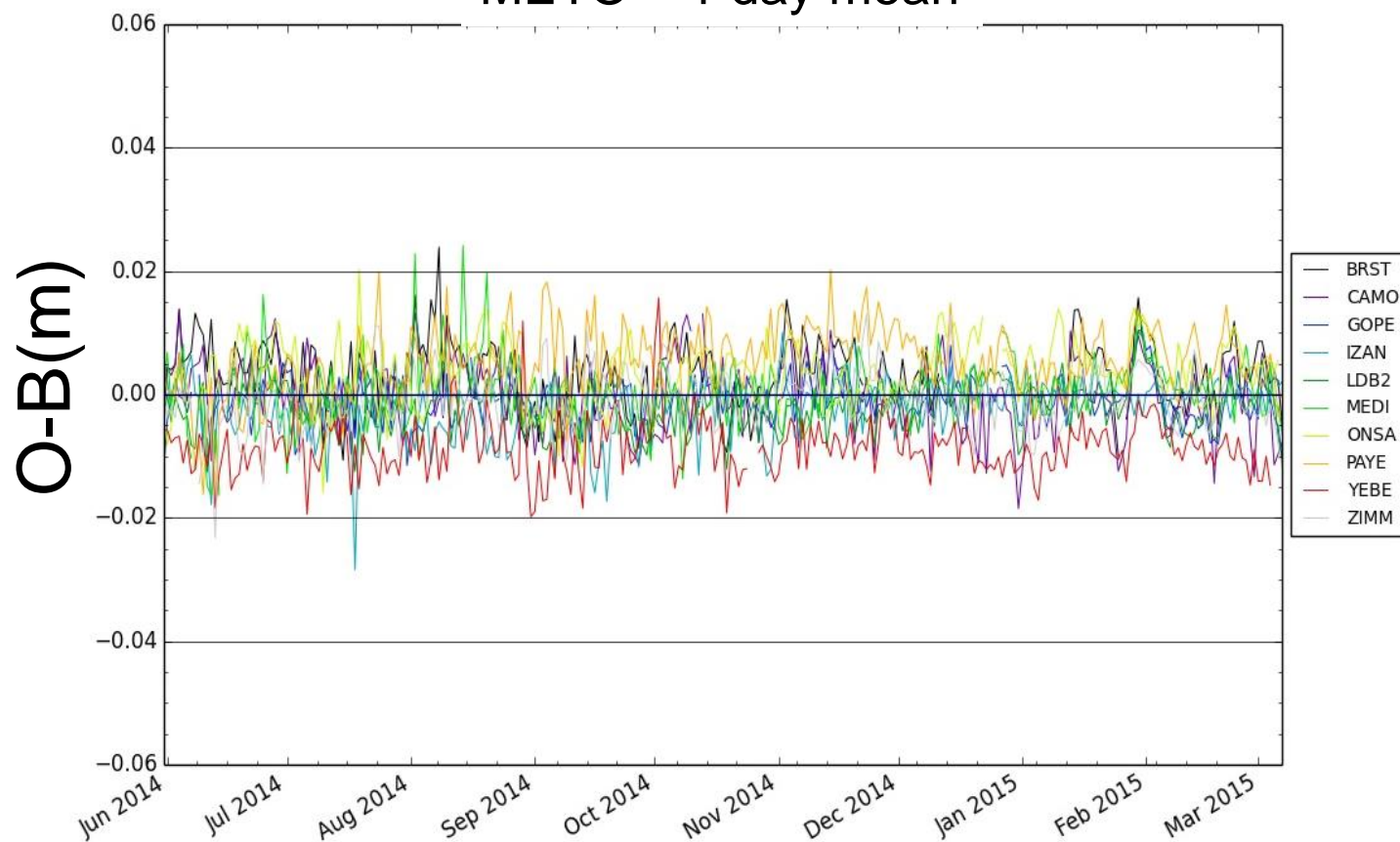
What about biases?

GFZ – 1 day mean



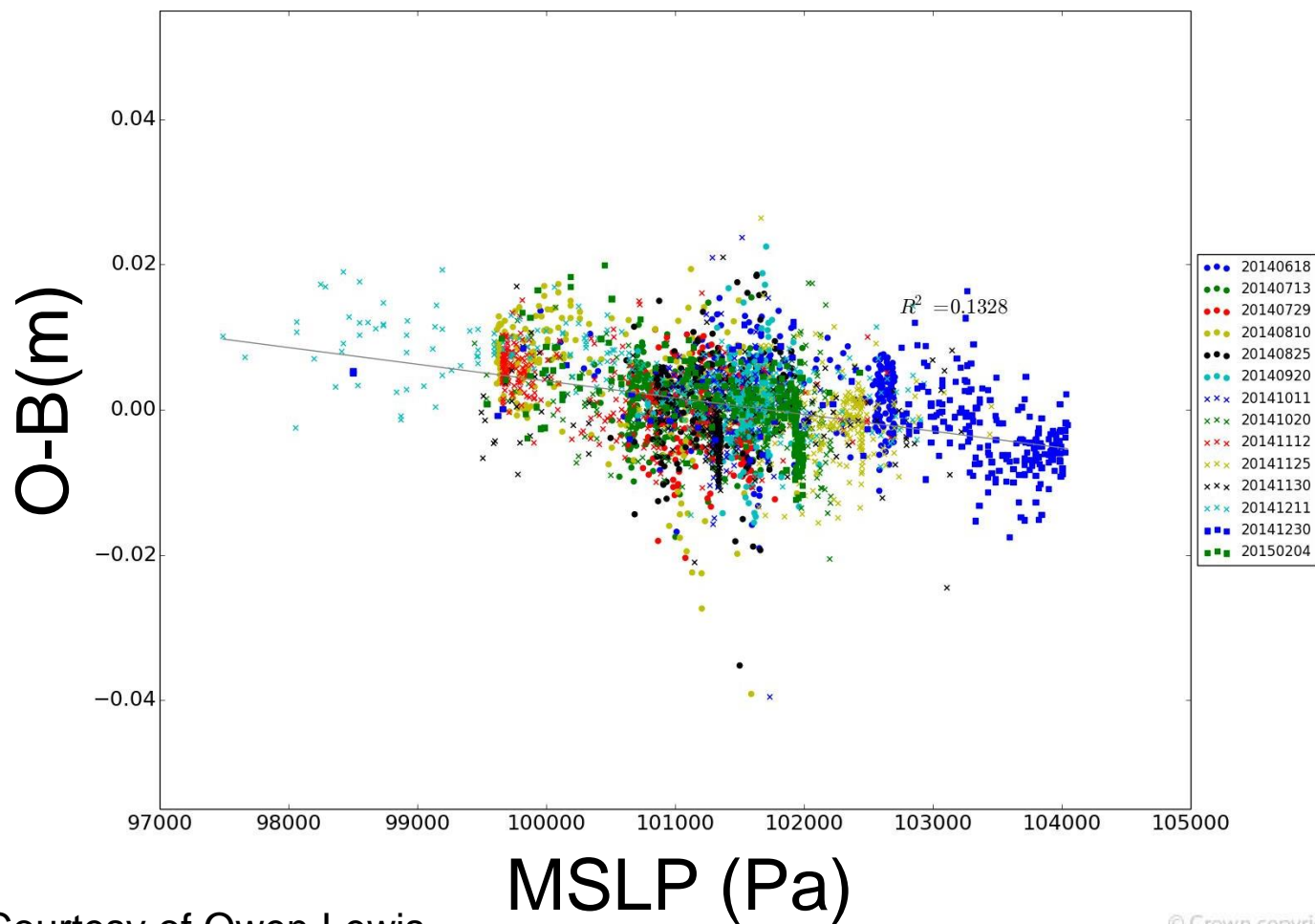
What about biases?

METO – 1 day mean



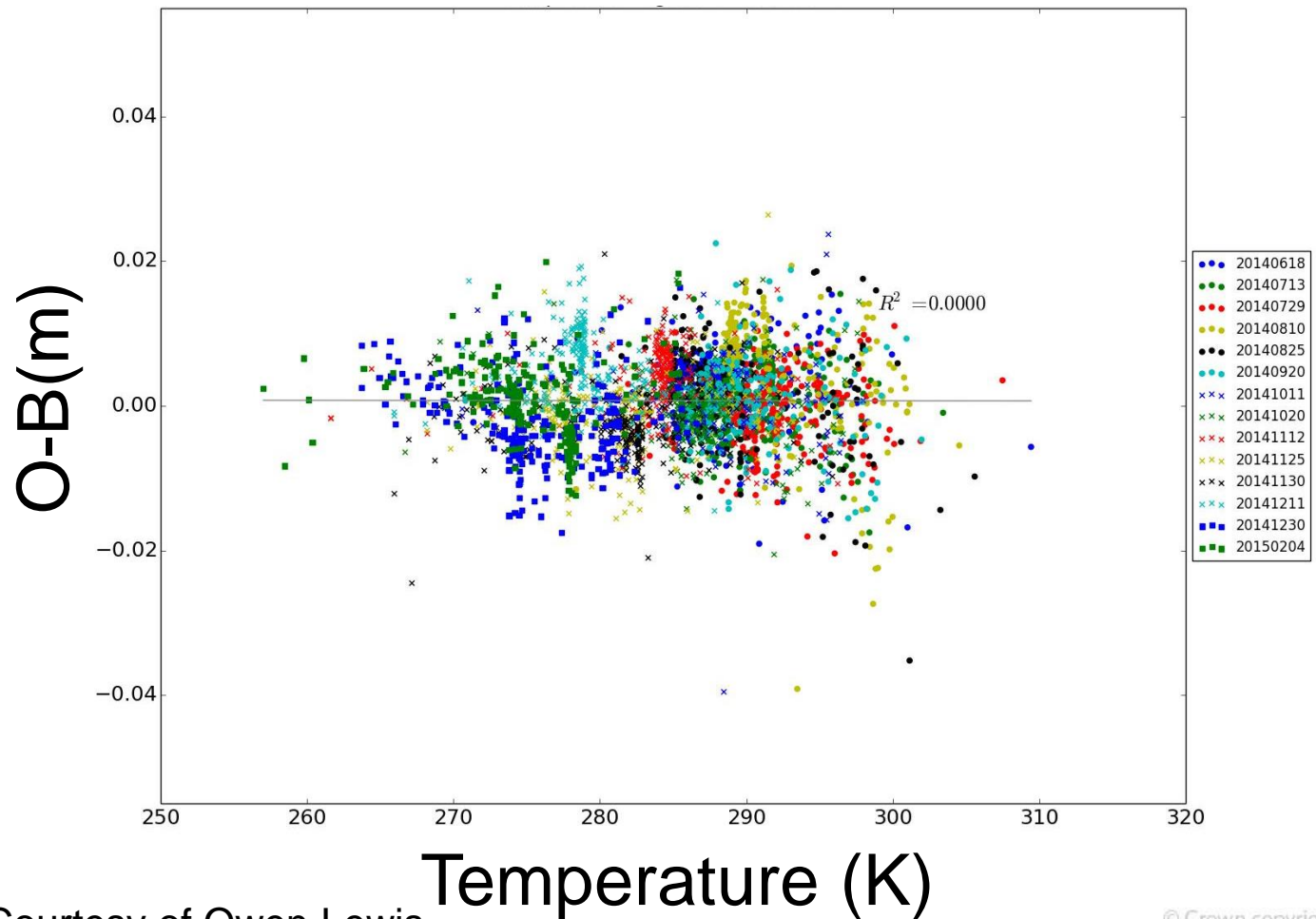
MSLP

$$R^2 = 0.1328$$



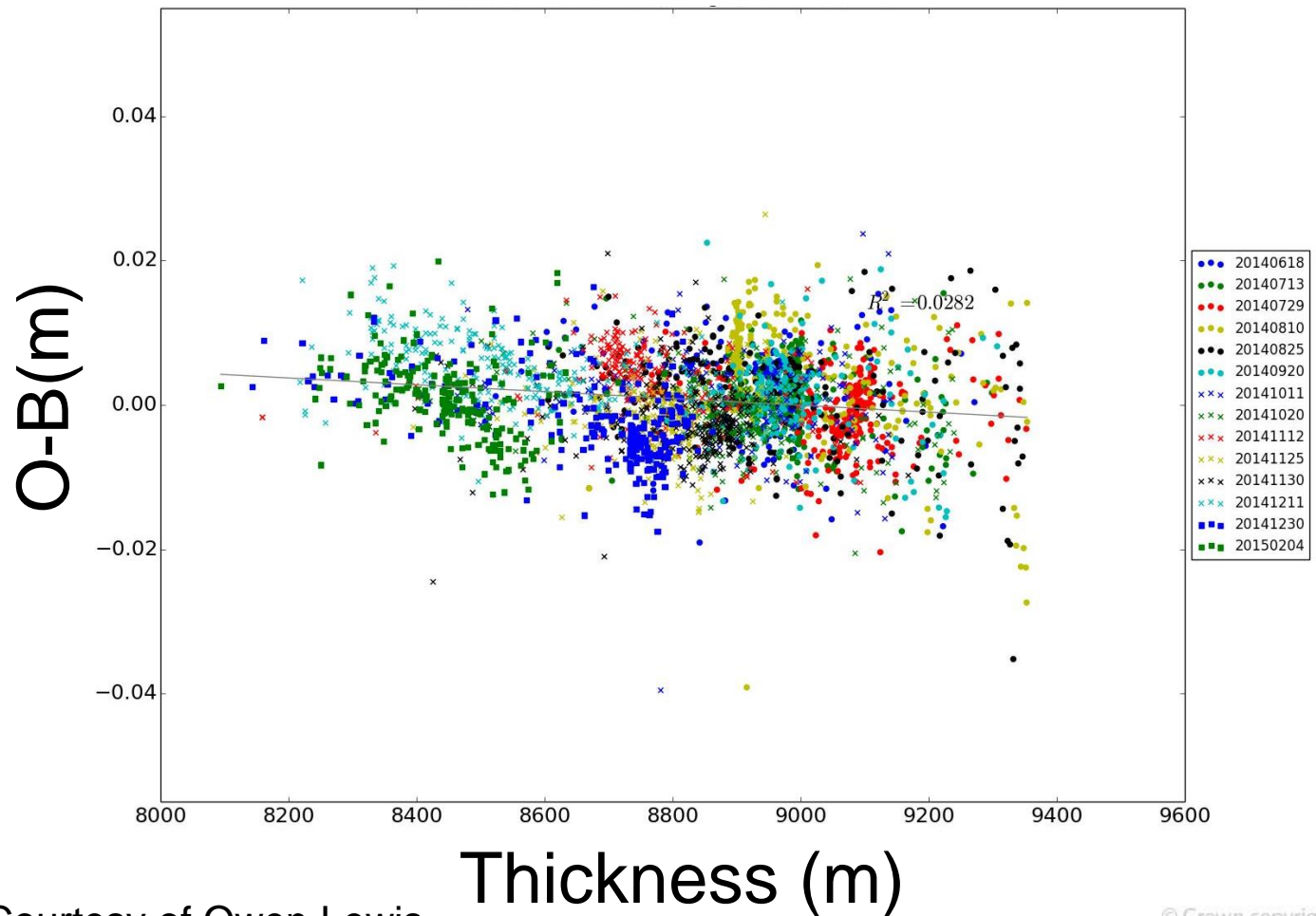
Surface Temperature

$$R^2 = 0.0000$$



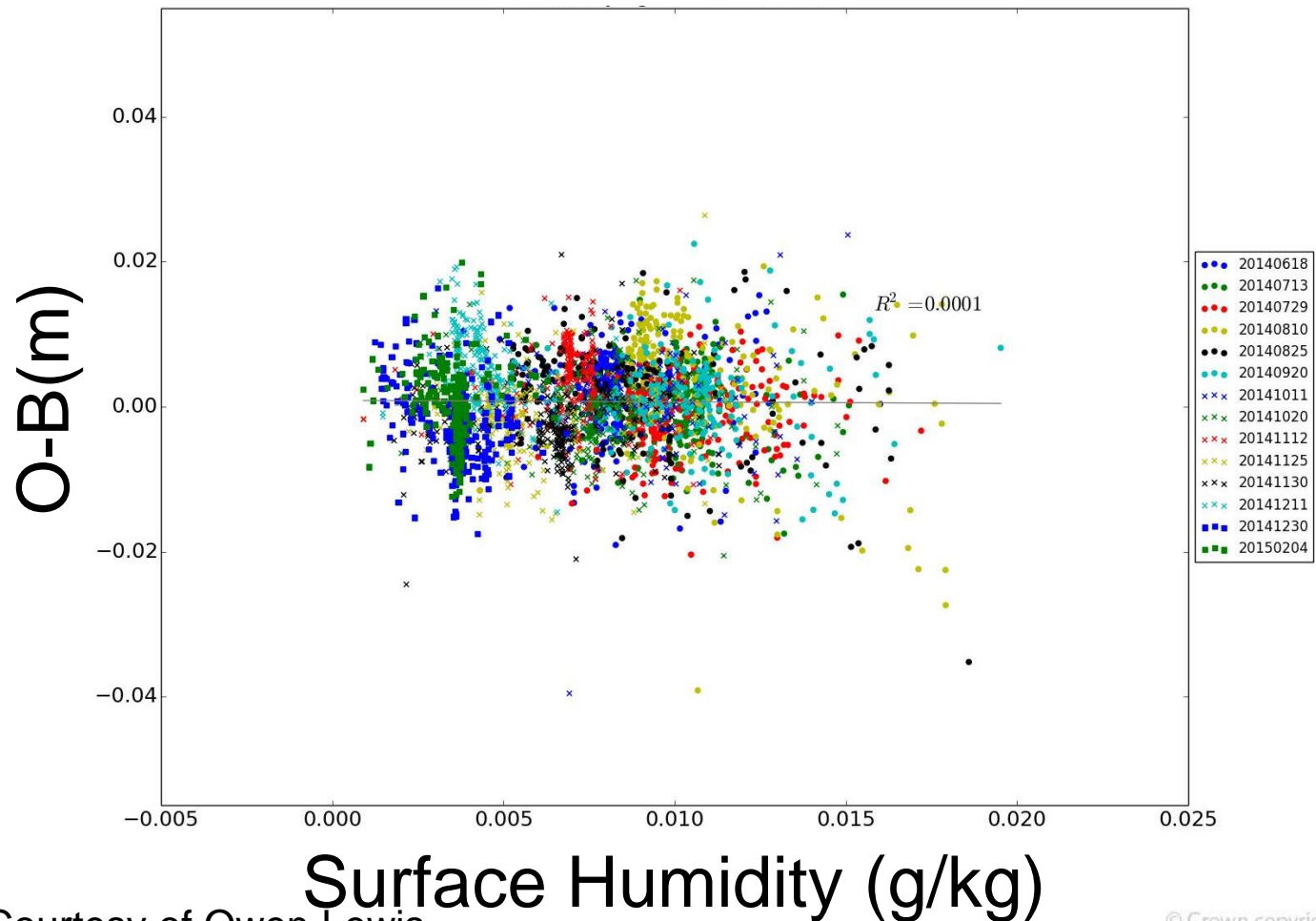
1000-300hPa Thickness

$$R^2 = 0.0282$$



Surface Humidity

$$R^2 = 0.0001$$



Applying Desroziers et al. (2005) method to ZTDs

$$R(i, j) = \frac{1}{N} \sum_{k=1}^{k=N} \{(O - A)_i (O - B)_j\}_k$$

R is the covariance matrix of observations with different separation

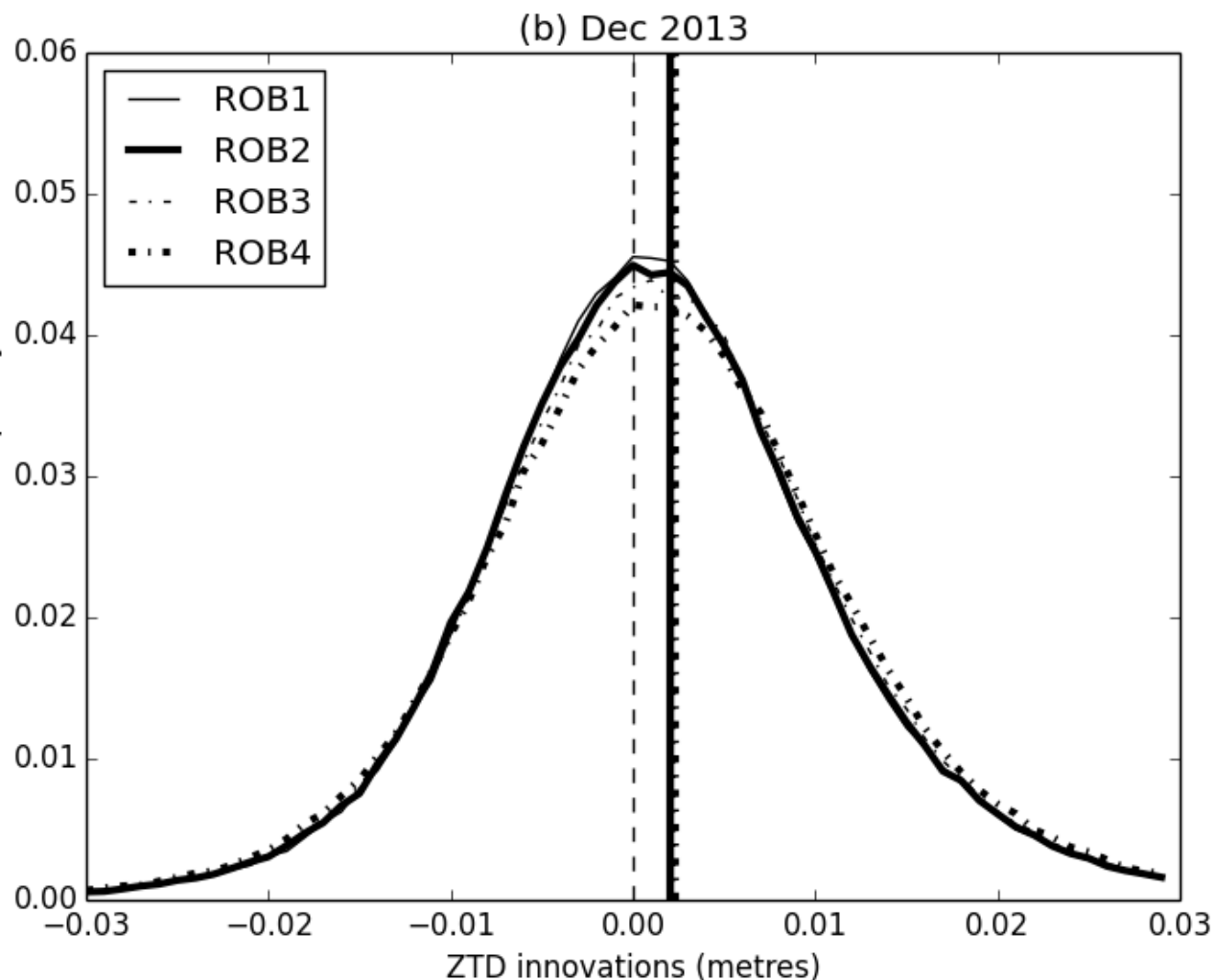
i, j are observation pairs separated by space or time

N number of observations

K number of pairs

Applying Desroziers et al. (2005) method to ZTDs

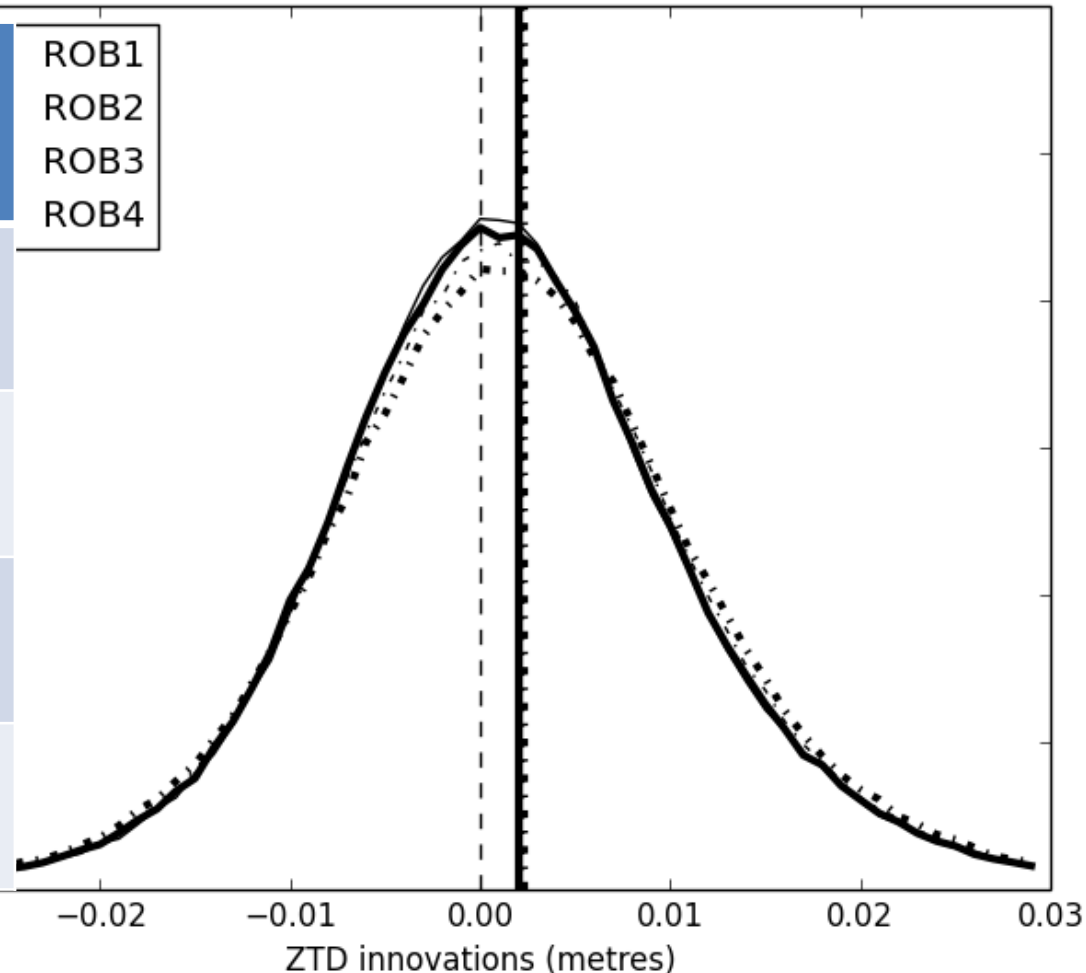
AC (relative constraints)	Mean O-B	σ O-B
ROB1 (1.0)	2.09	10.47
ROB2 (2.0)	2.05	10.39
ROB3 (4.0)	2.19	10.47
ROB4 (7.0)	2.29	10.81



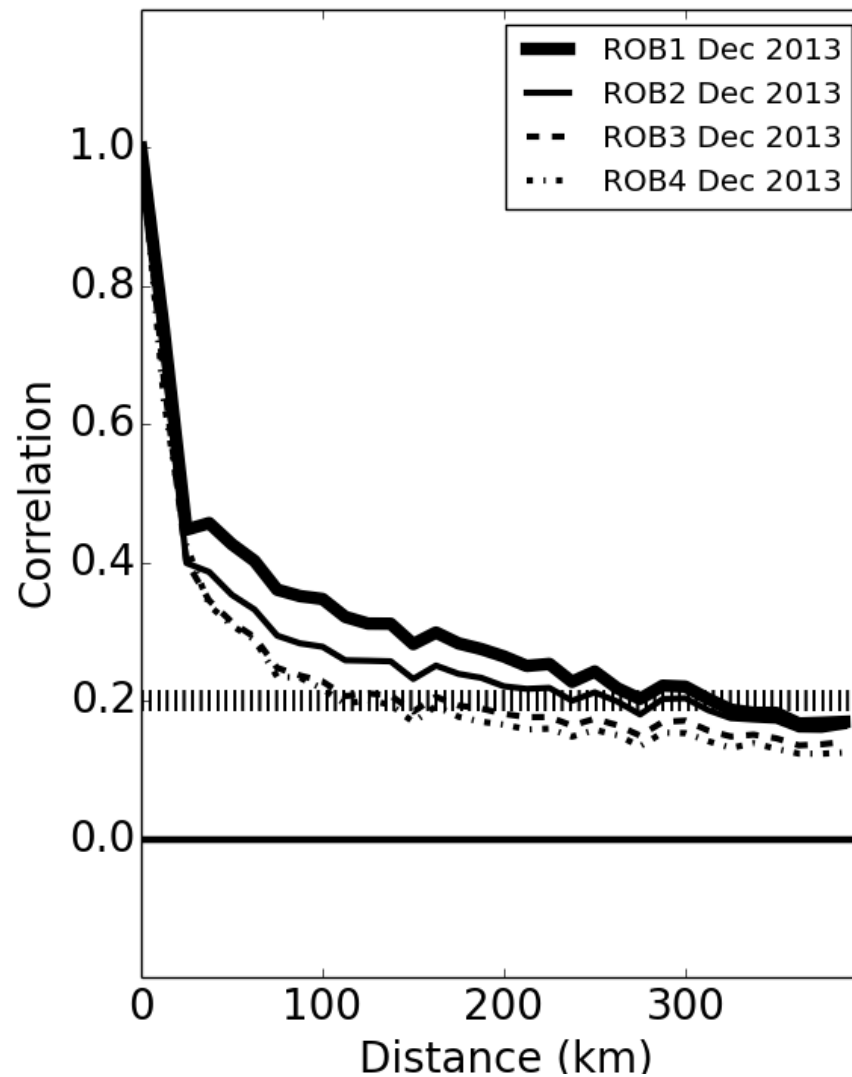
Applying Desroziers et al. (2005) method to ZTDs

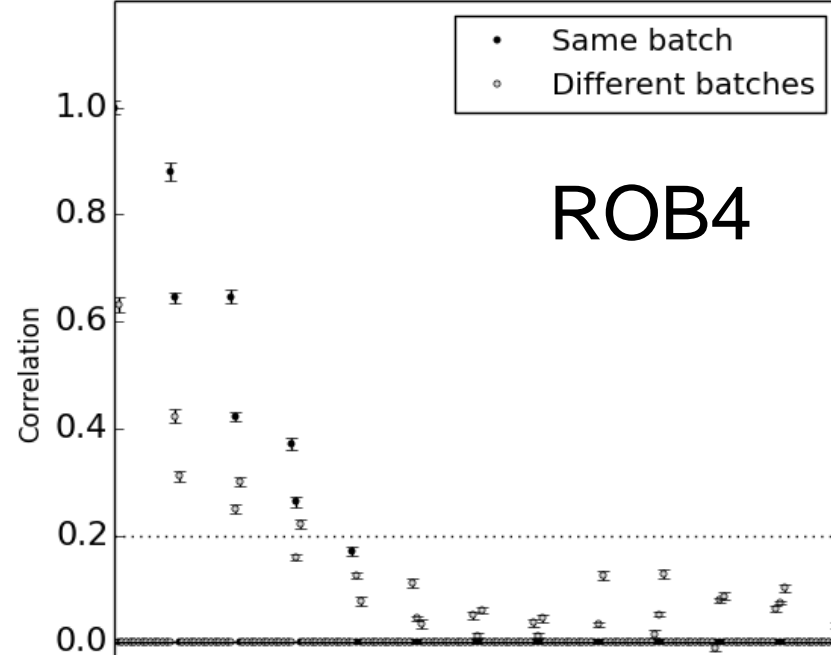
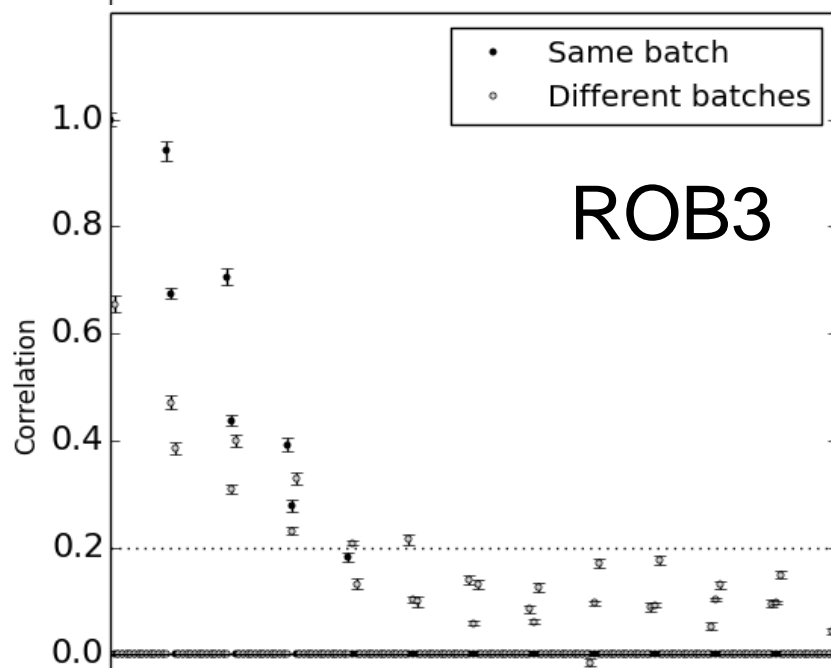
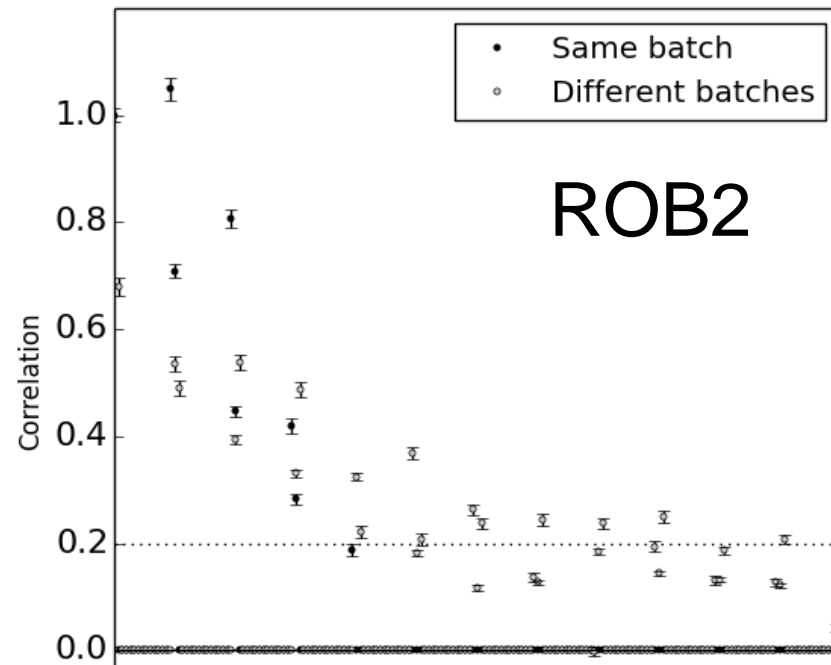
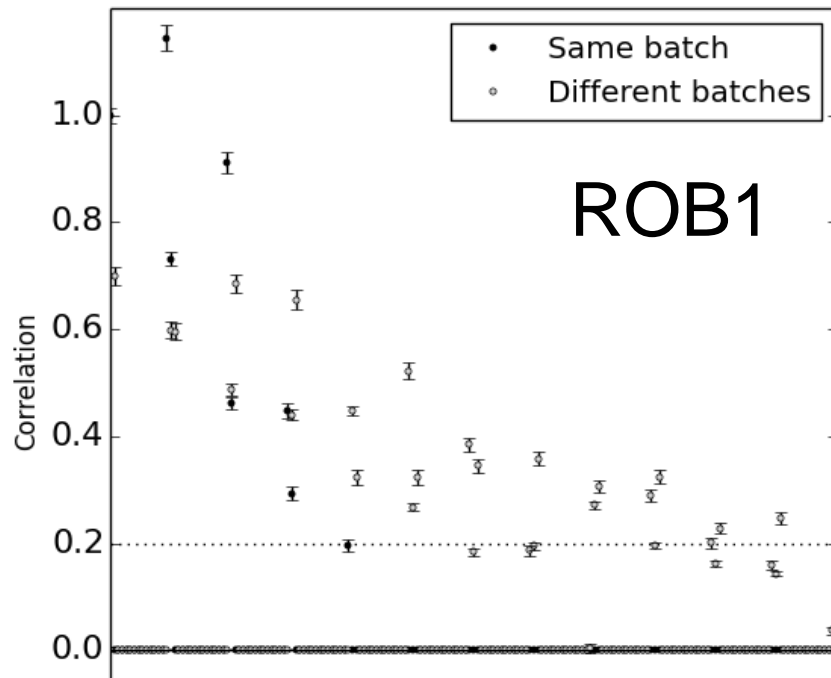
(b) Dec 2013

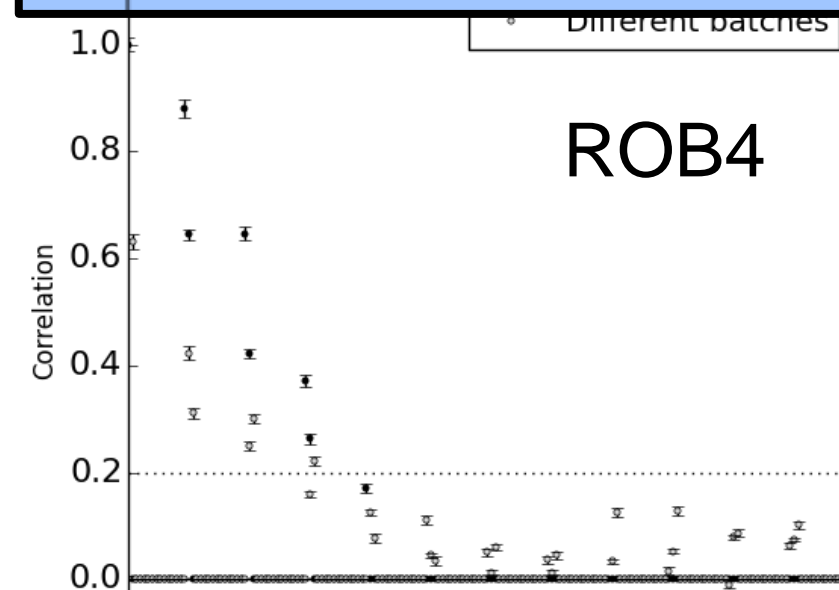
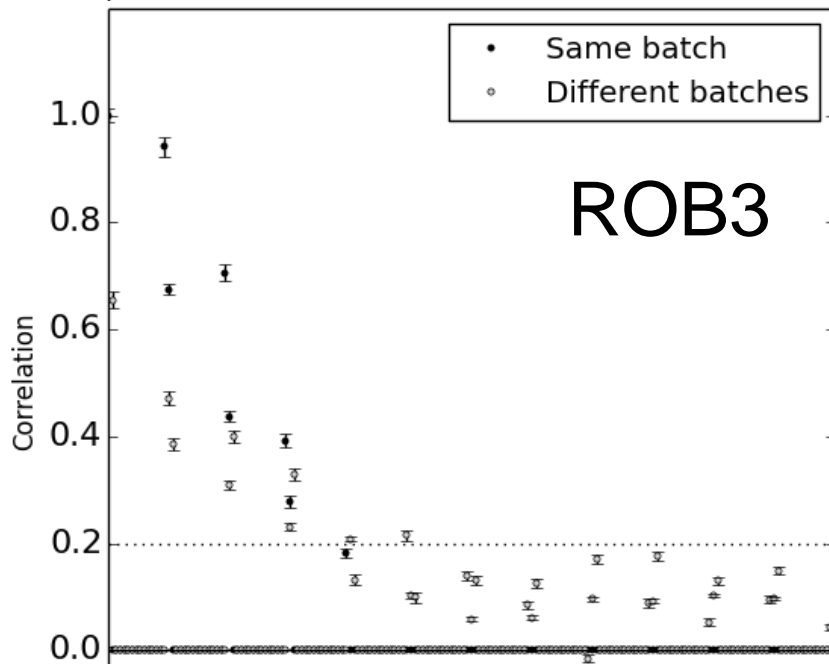
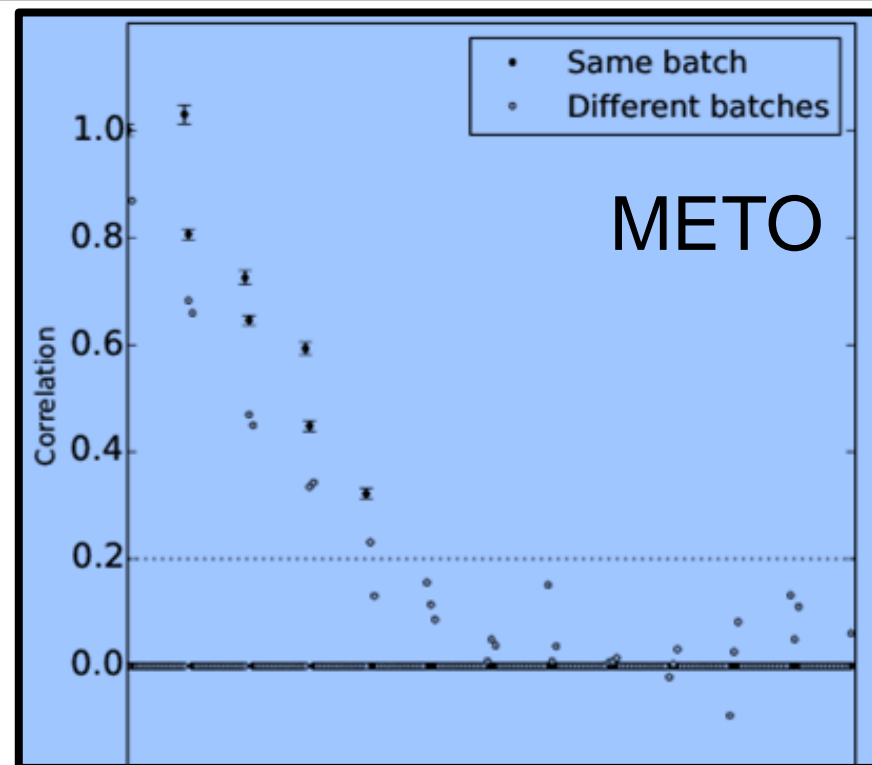
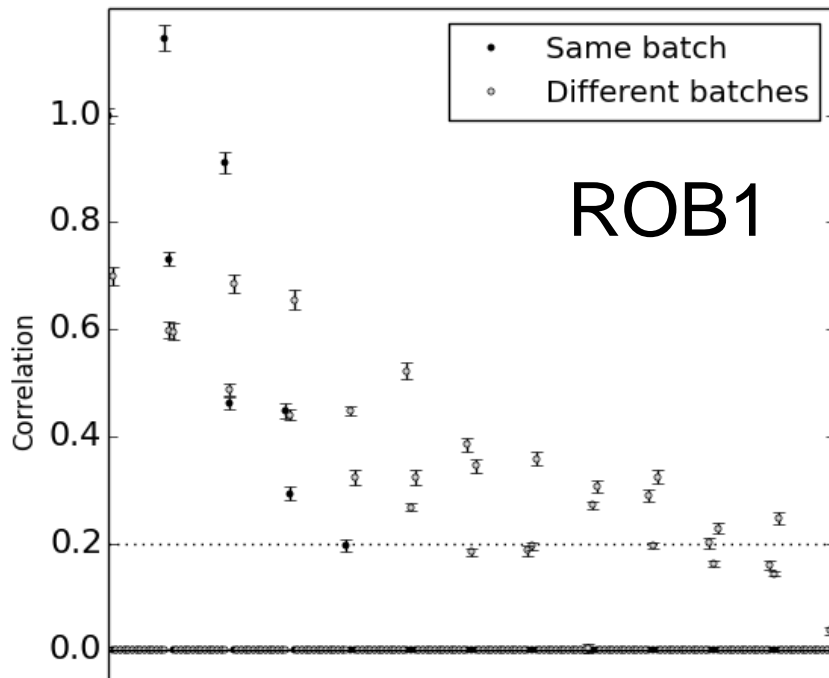
AC (relative constraints)	Mean O-B	σ O-B	σ	ROB1 ROB2 ROB3 ROB4
ROB1 (1.0)	2.09	10.47	6.08	
ROB2 (2.0)	2.05	10.39	7.16	
ROB3 (4.0)	2.19	10.47	7.57	
ROB4 (7.0)	2.29	10.81	8.08	



Applying Desroziers et al. (2005) method to ZTDs







Further questions

- As we move towards higher resolution NWP, do we need more variability and less correlation in the ZTDs?
- What else in the processing is affecting the correlations?

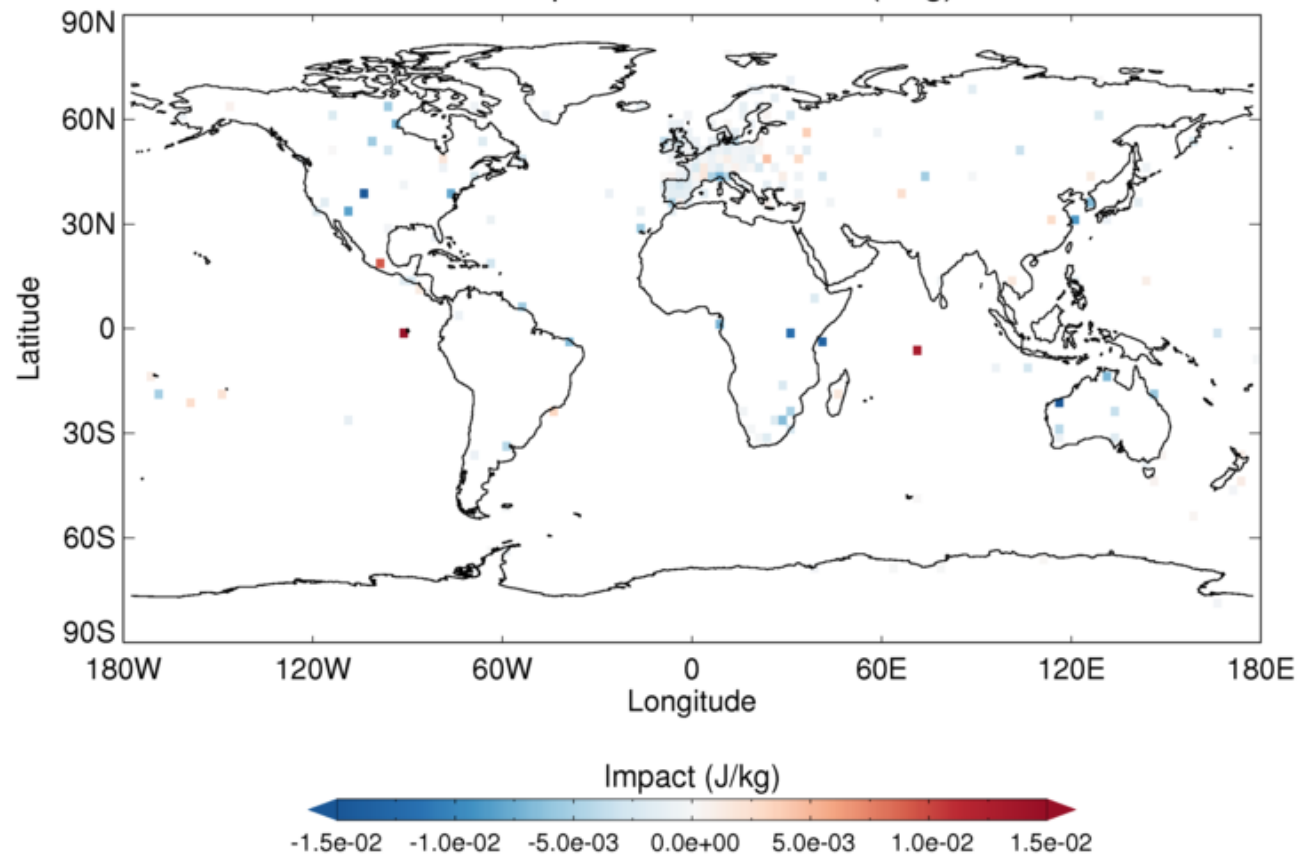
Further questions

- As we move towards higher resolution NWP, do we need more variability and less correlation in the ZTDs?
- What else in the processing is affecting the correlations?

ZTD Impact

Ground GPS / 20160701T0000Z-20160731T1800Z

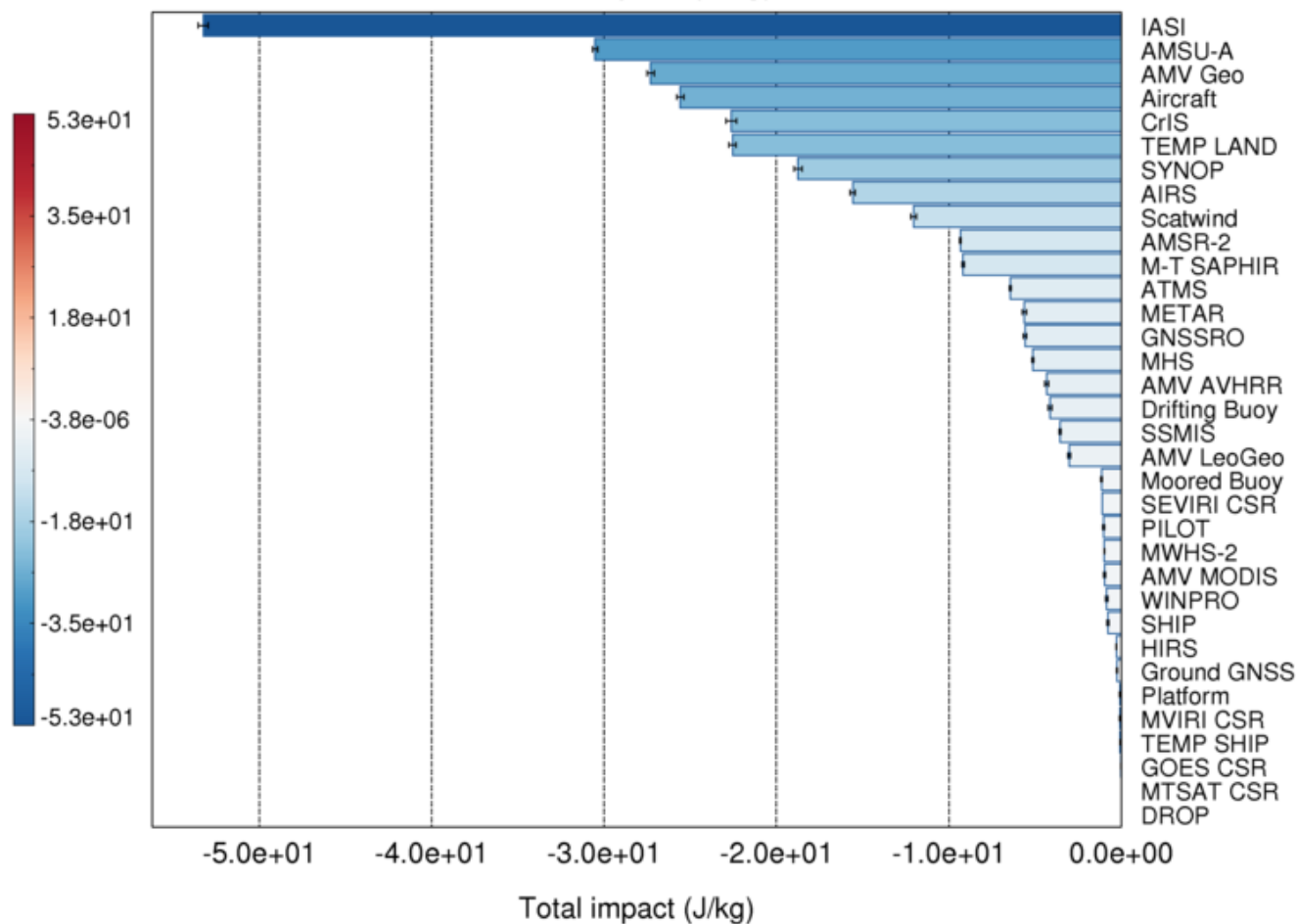
Total impact of observations (J/kg)



ZTD Impact

All observations / 20160701T0000Z-20160731T0600Z

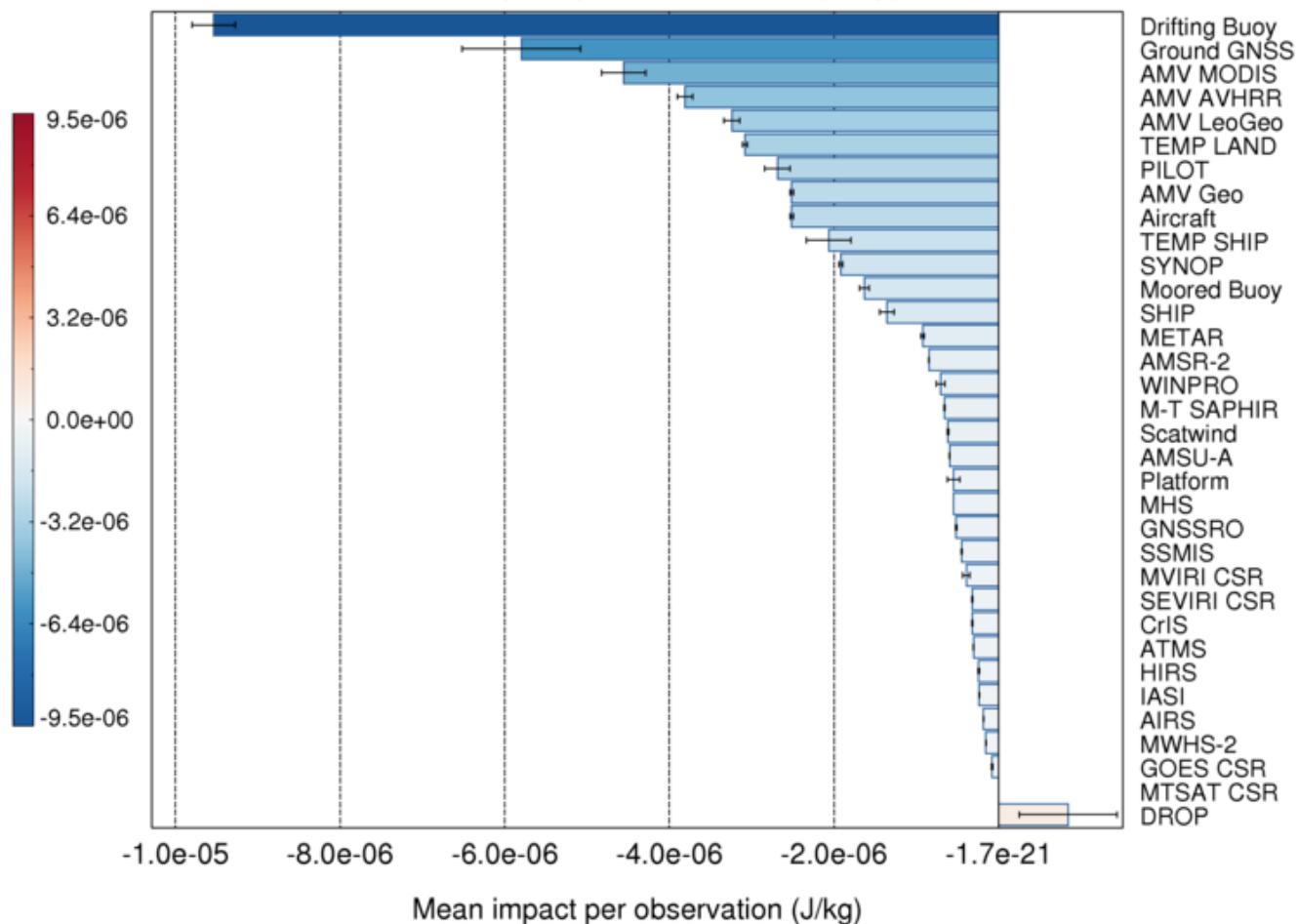
Total impact (J/kg)



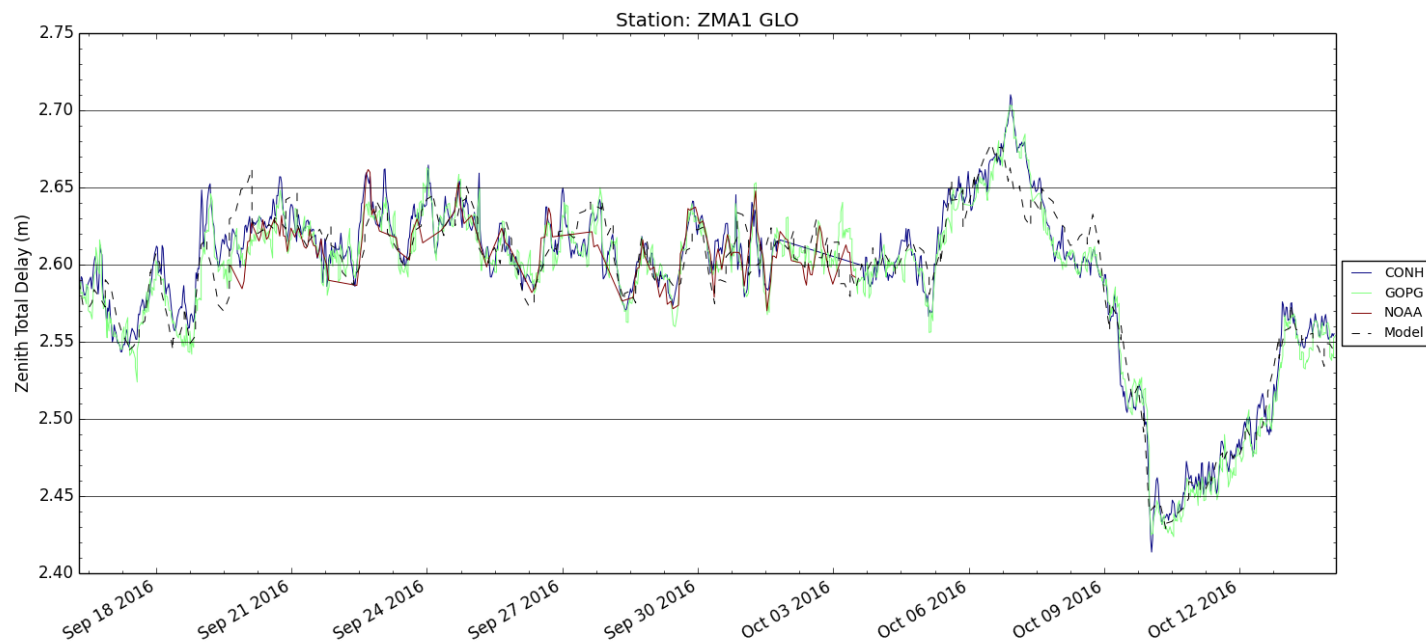
ZTD Impact

All observations / 20160701T0000Z-20160731T0600Z

Mean impact per observation (J/kg)



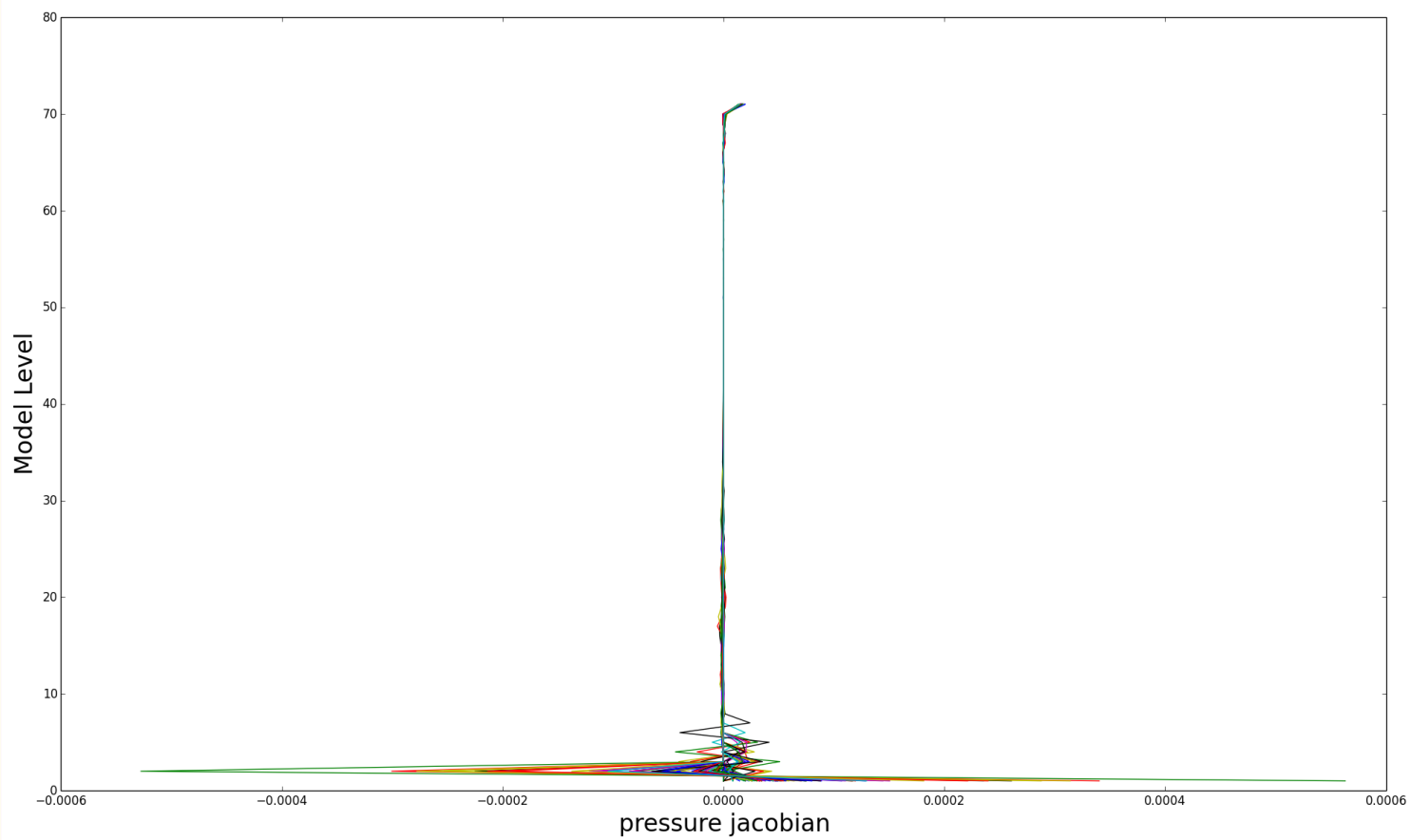
Hurricane Matthew



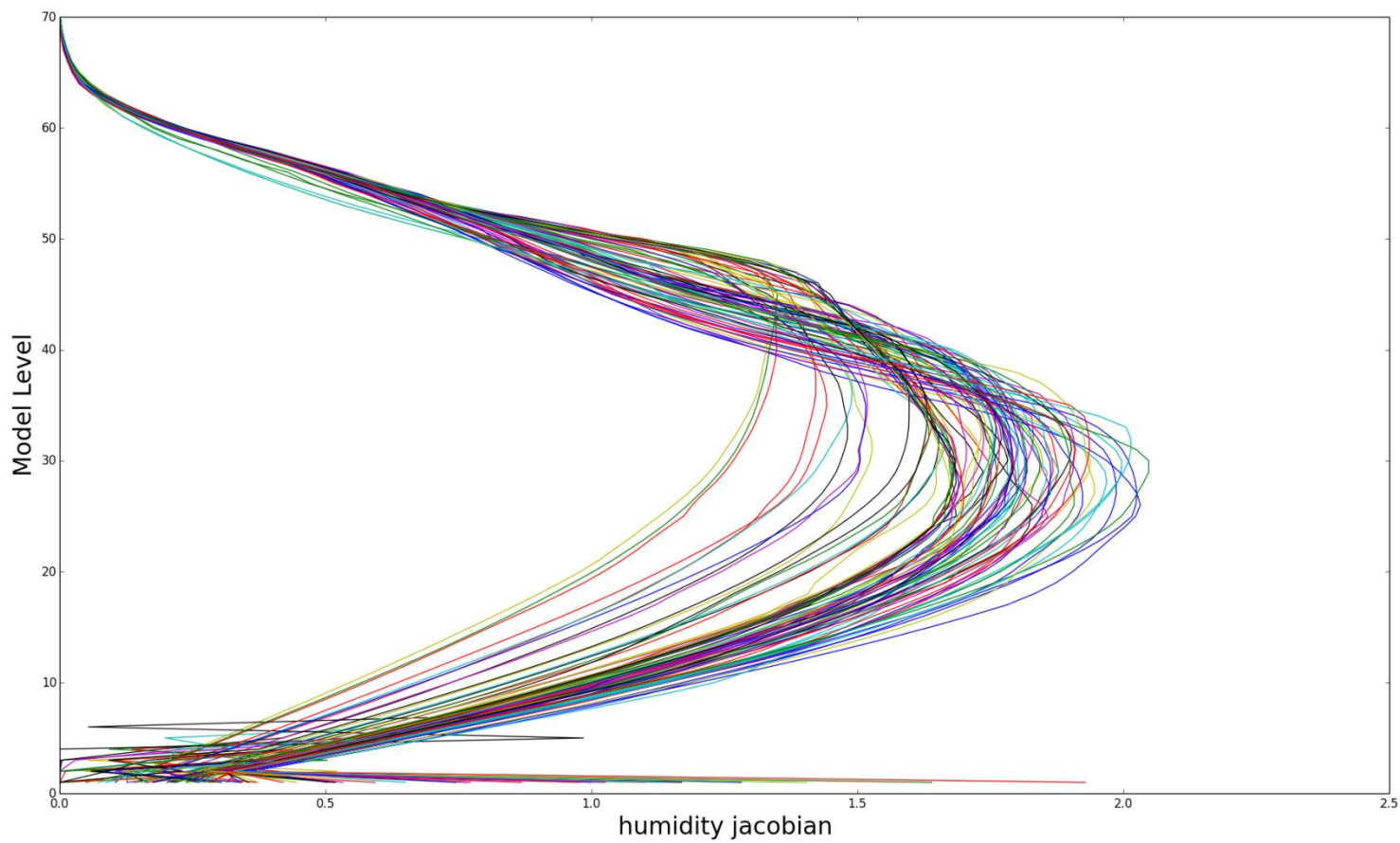


Met Office

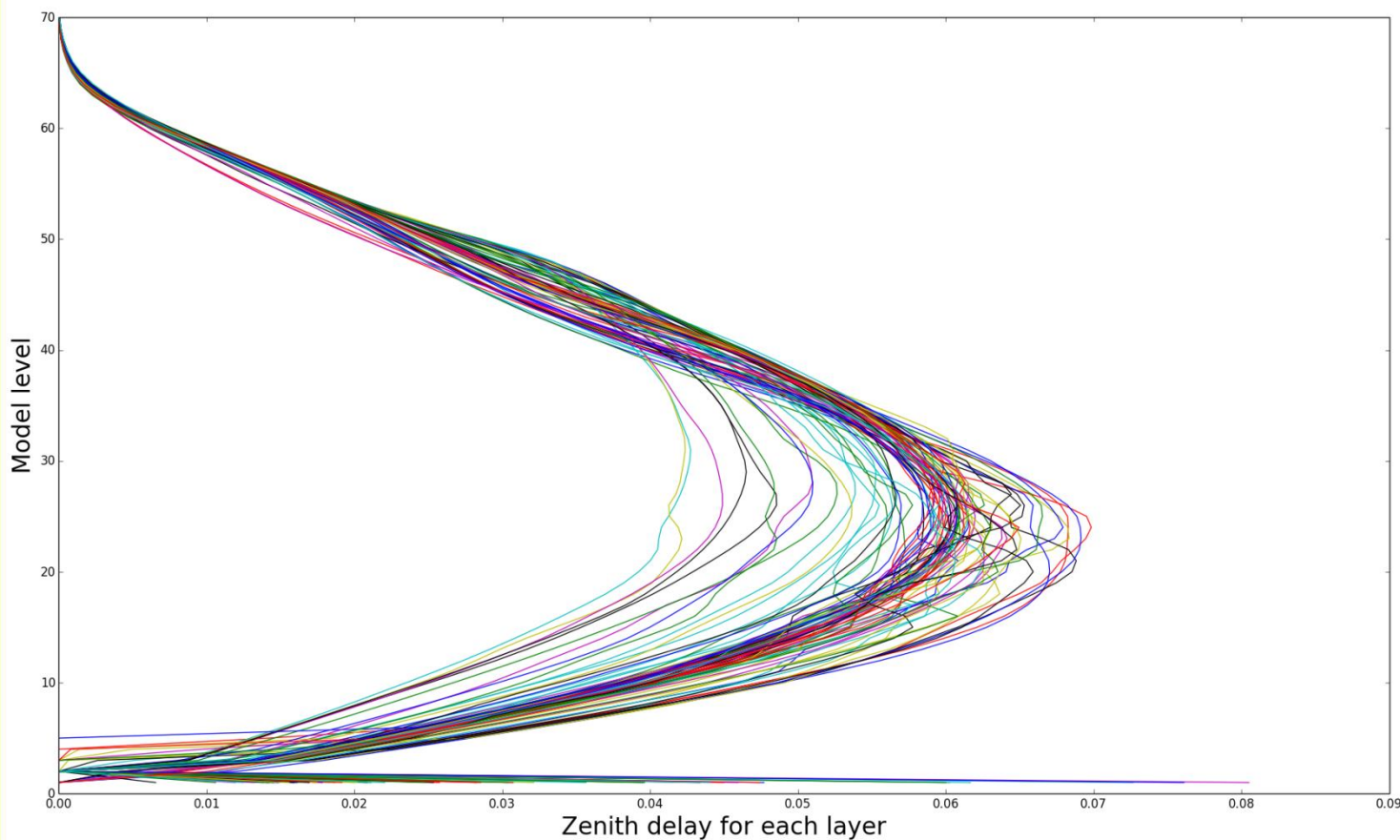
dZD/dP



dZD/dq



Zenith Delay calculated for each model layer



Zenith Delay calculated for each model layer

