

PBH Update

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MSU Group Meeting

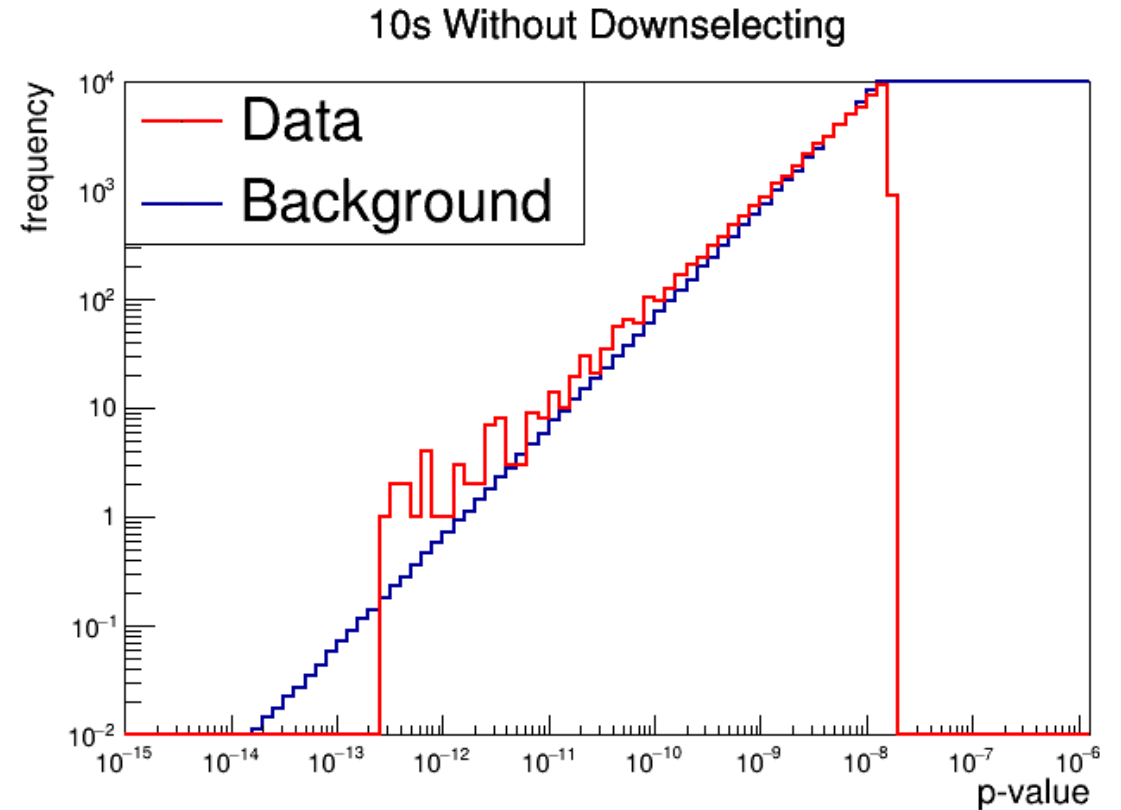
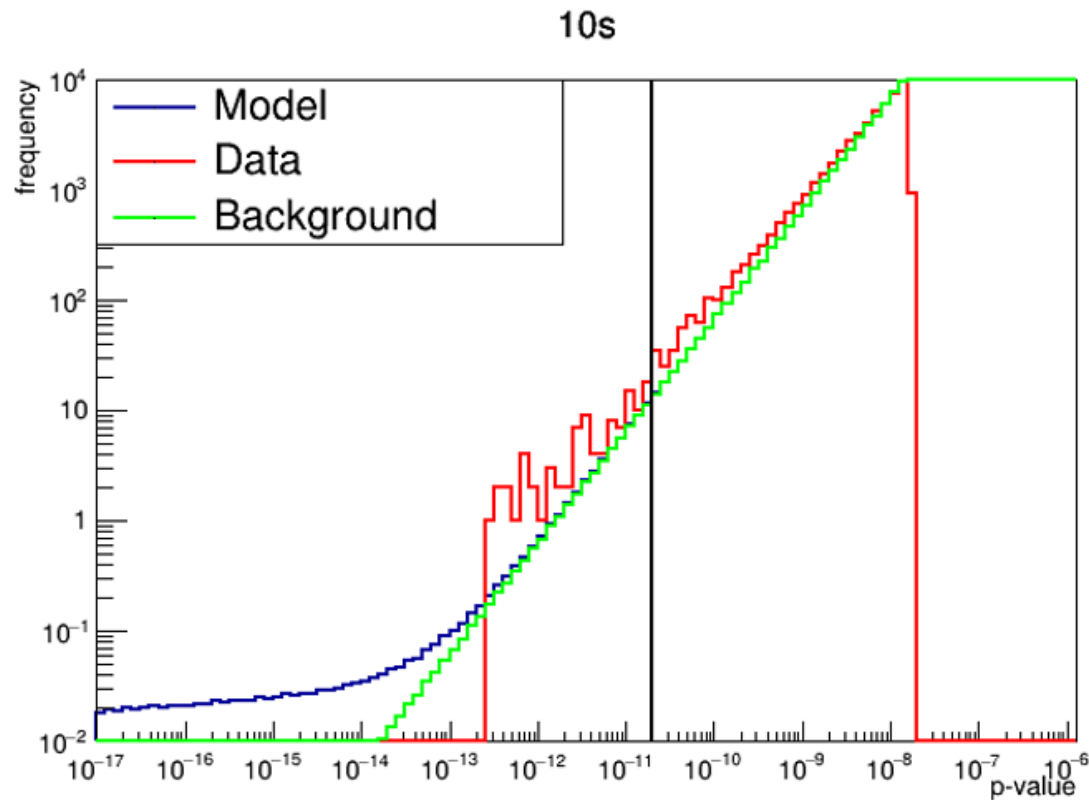
5/23/2019

Downselecting the GRB data

- Josh's GRB search uses $2.1^\circ \times 2.1^\circ$ bins in RA and dec, and advances the bin by 0.11° each time
- This large overlap leads to oversampling
- Question: What happens when we effectively change the overlap between bins in the search?
- Only look at 10s time bin for now

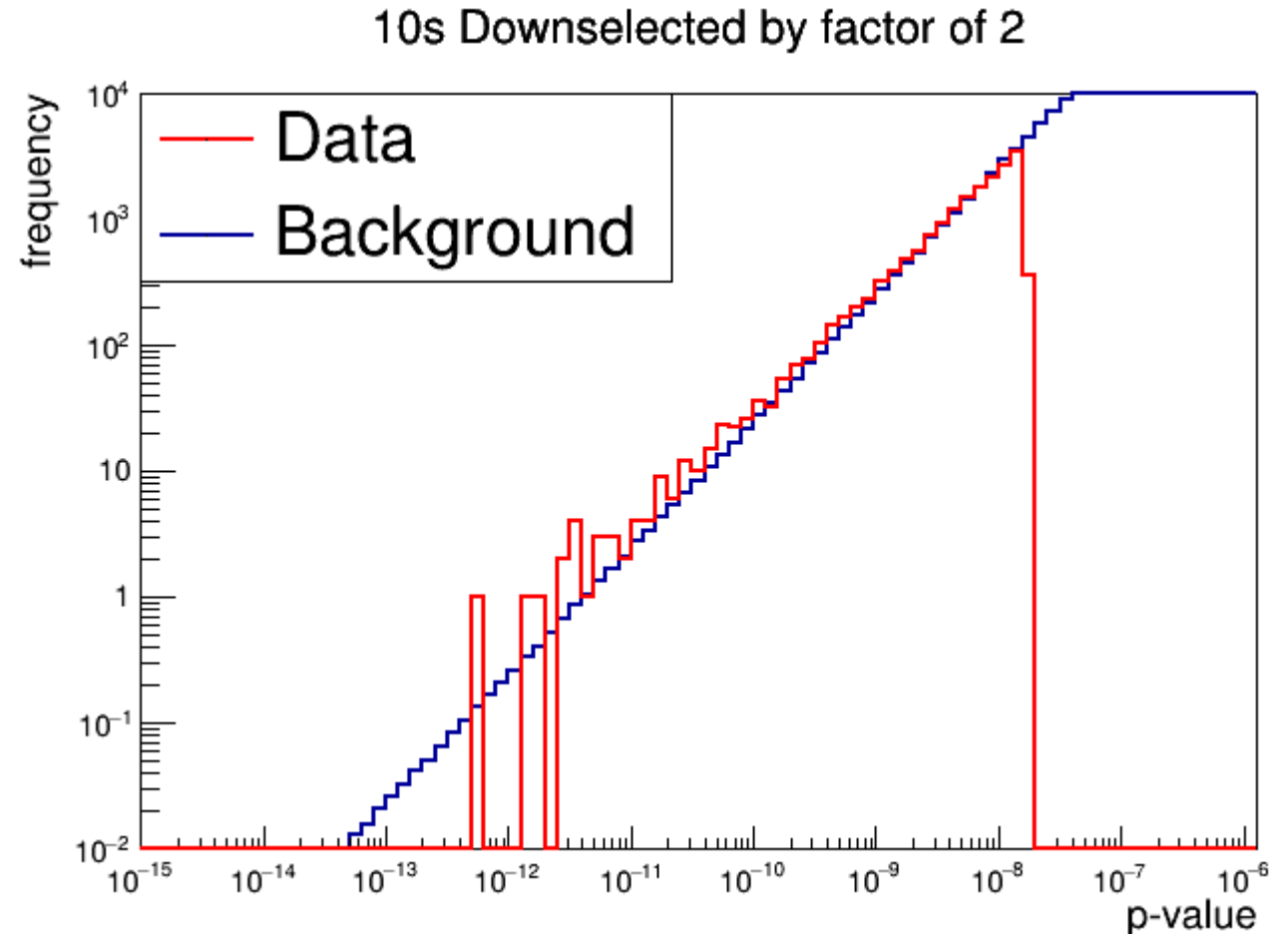
Without downselecting

- Slopes of data and background histograms don't quite match



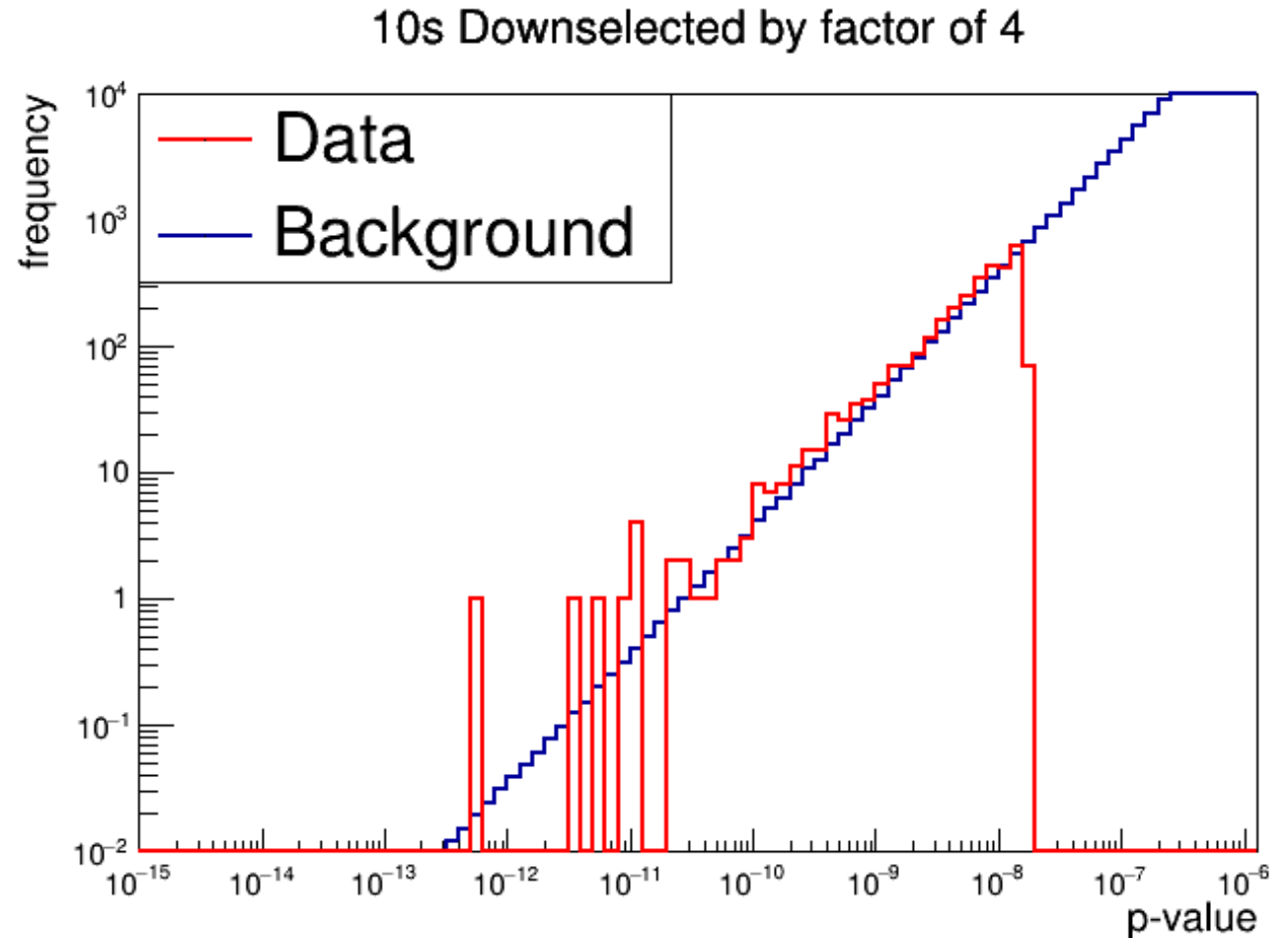
With downselecting by factor of 2

- Advance spatial bins by $.22^\circ$ (instead of $.11^\circ$) and time bins by 2s (instead of 1s)



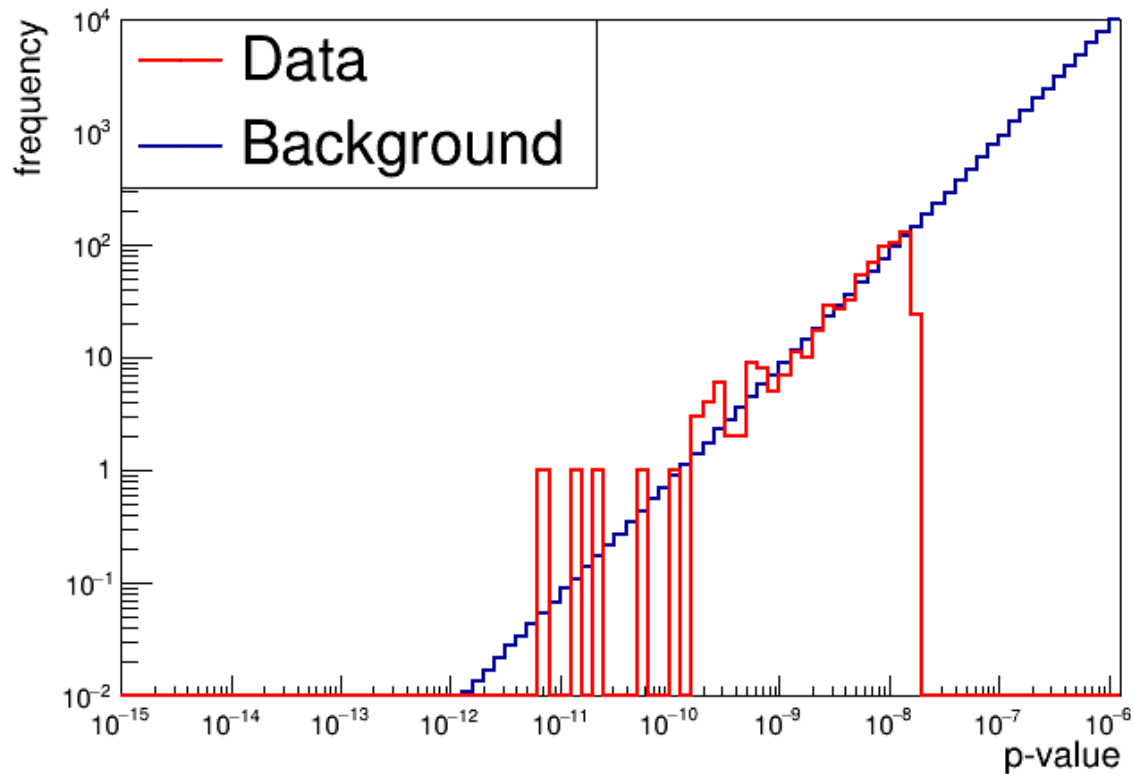
With downselecting by factor of 4

- Advance spatial bins by $.44^\circ$ (instead of $.11^\circ$) and time bins by 4s (instead of 1s)

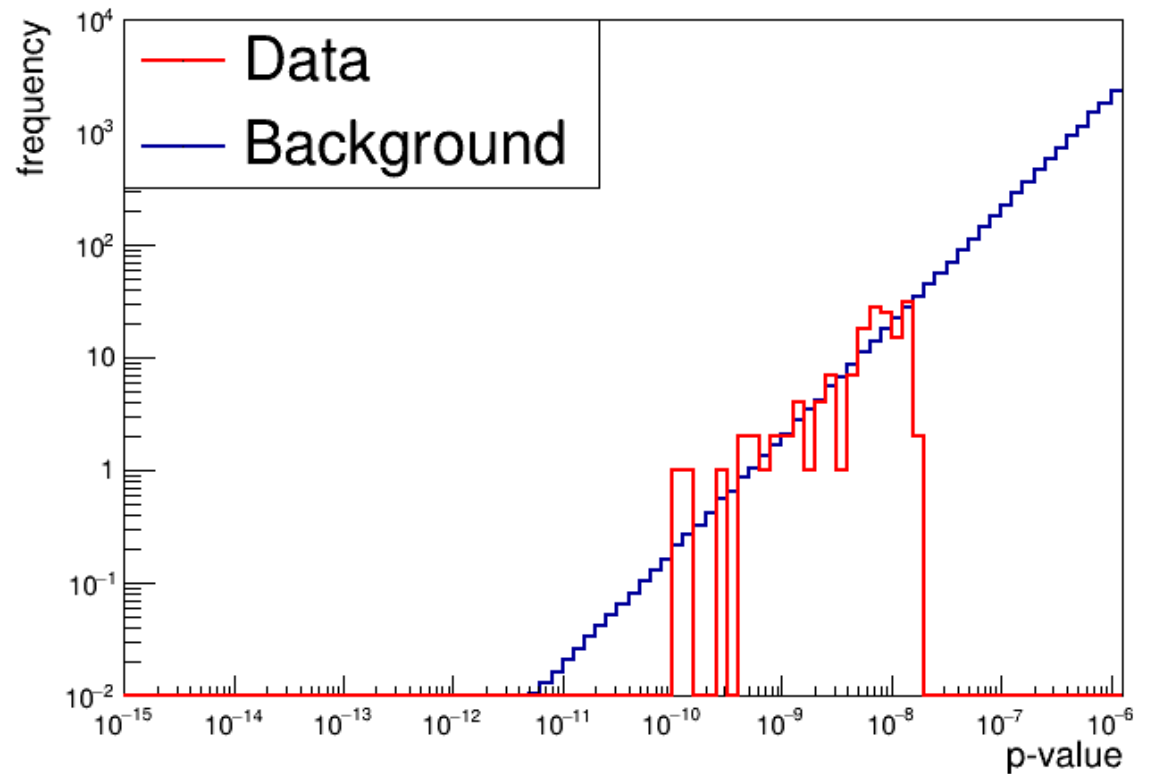


Downselecting by factors of 6 and 8

10s Downselected by factor of 6



10s Downselected by factor of 8



Conclusions/Next Steps

- Downselecting by a factor of 4 seems to improve the agreement between the data and background histograms the most without getting rid of too much of the data
- Implementing this change in Josh's code would make it run 64x faster
- Repeat for other time windows
- Recompute limits with downselected data
- Write ICRC proceedings – lots of overlap with paper
- Have 100s data from Josh now