Energy PSF dependence of fiducial scale and zenith angle for fixed fhit bins

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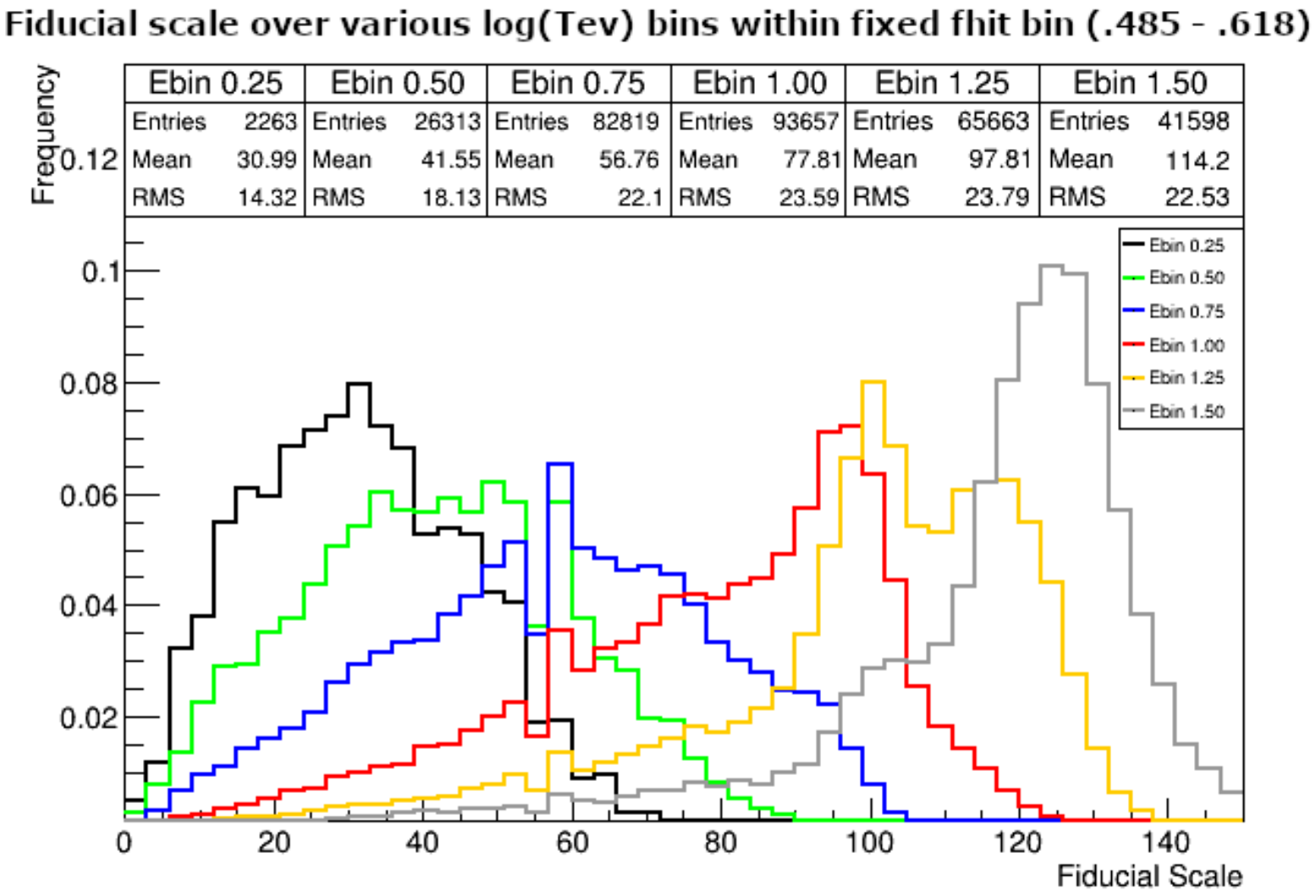
Ideally the energy PSF would be solely dependent on either zenith angle or event centering

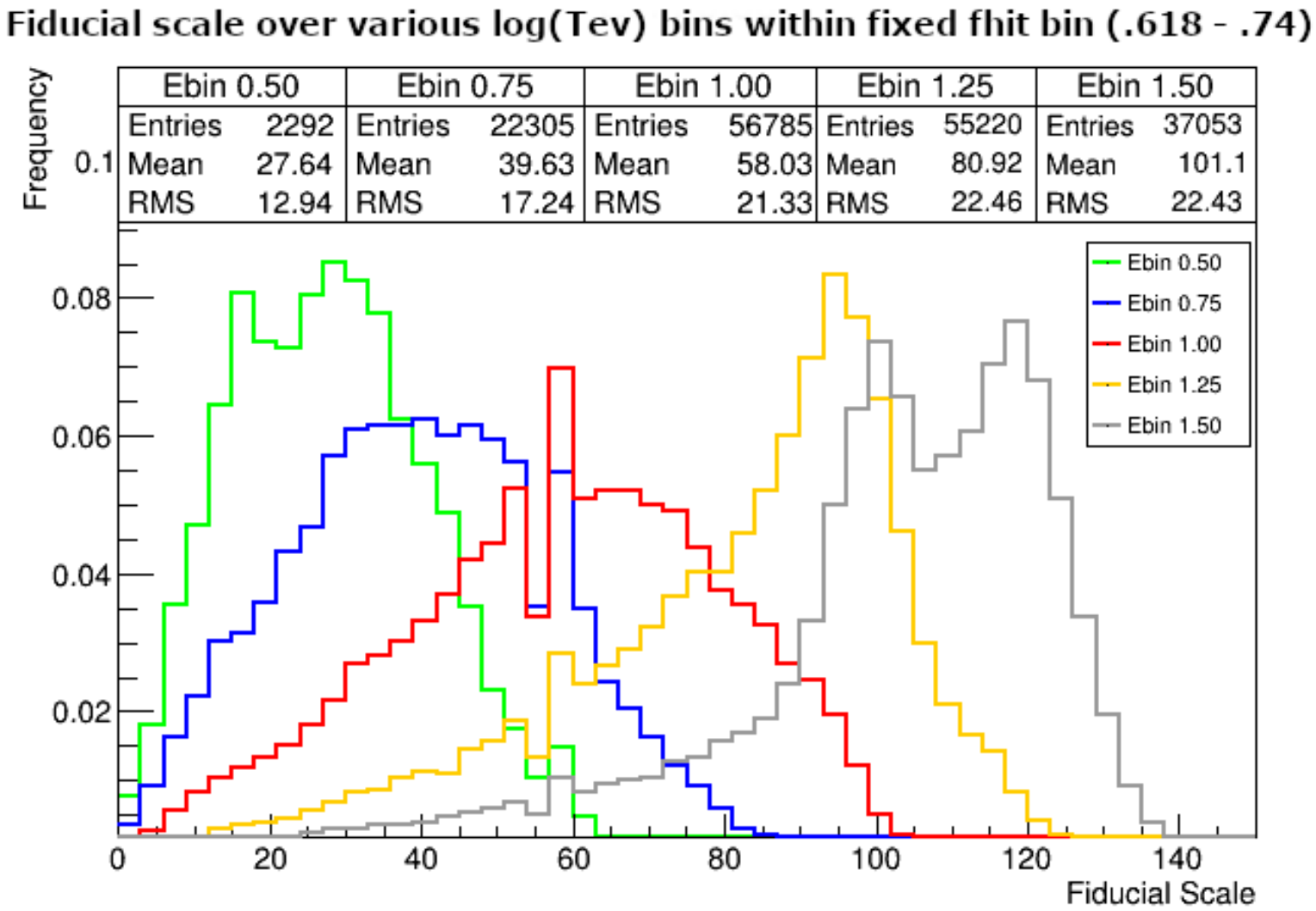
Here we find that it is dependent on both the fiducial scale and zenith angle but more so on the fiducial scale

Over the fiducial scale variable, the centering of events vary wildly between different energy bins for this low fhit bin

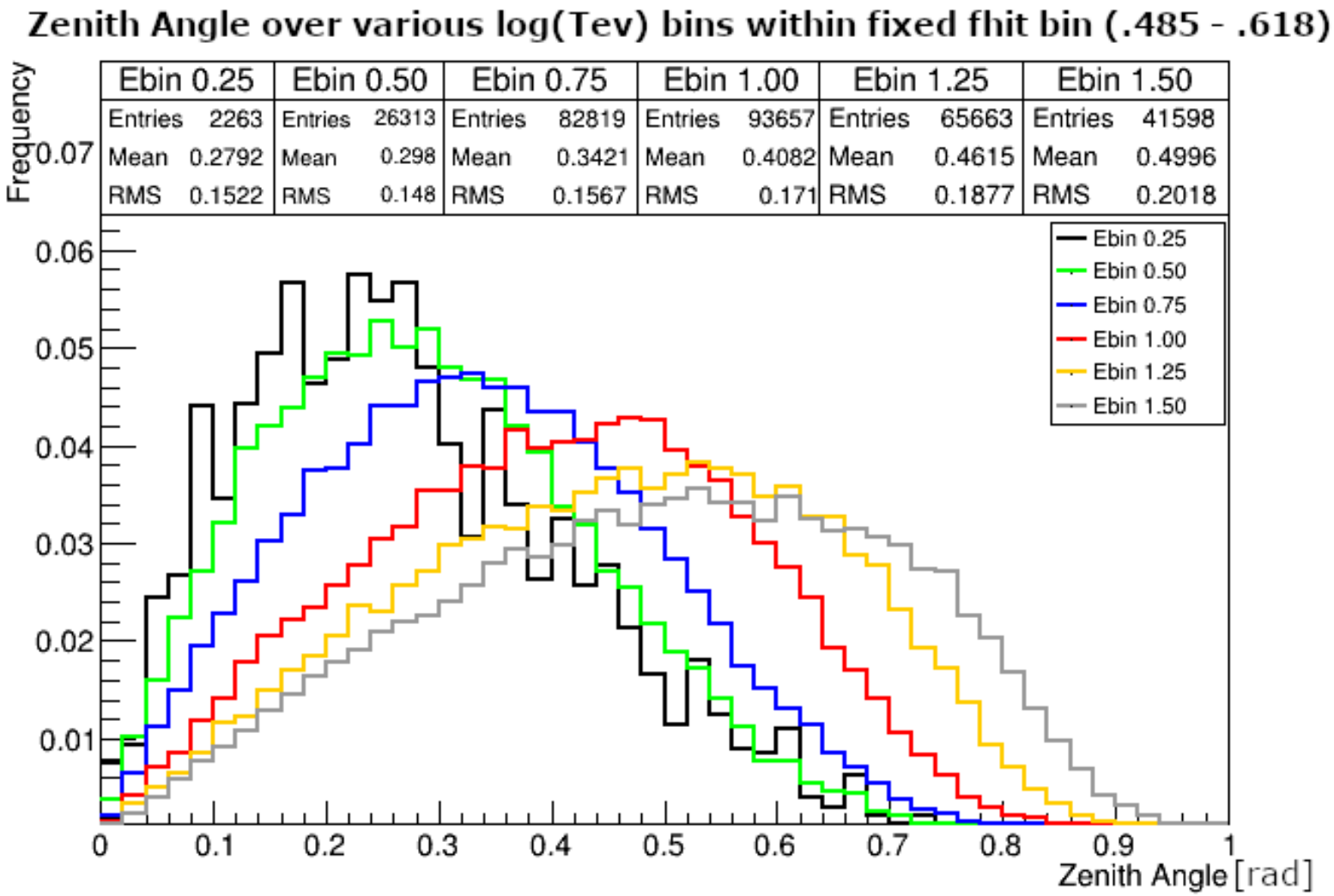


For this higher Fhit bin there are no events that fall into the lowest energy bin.

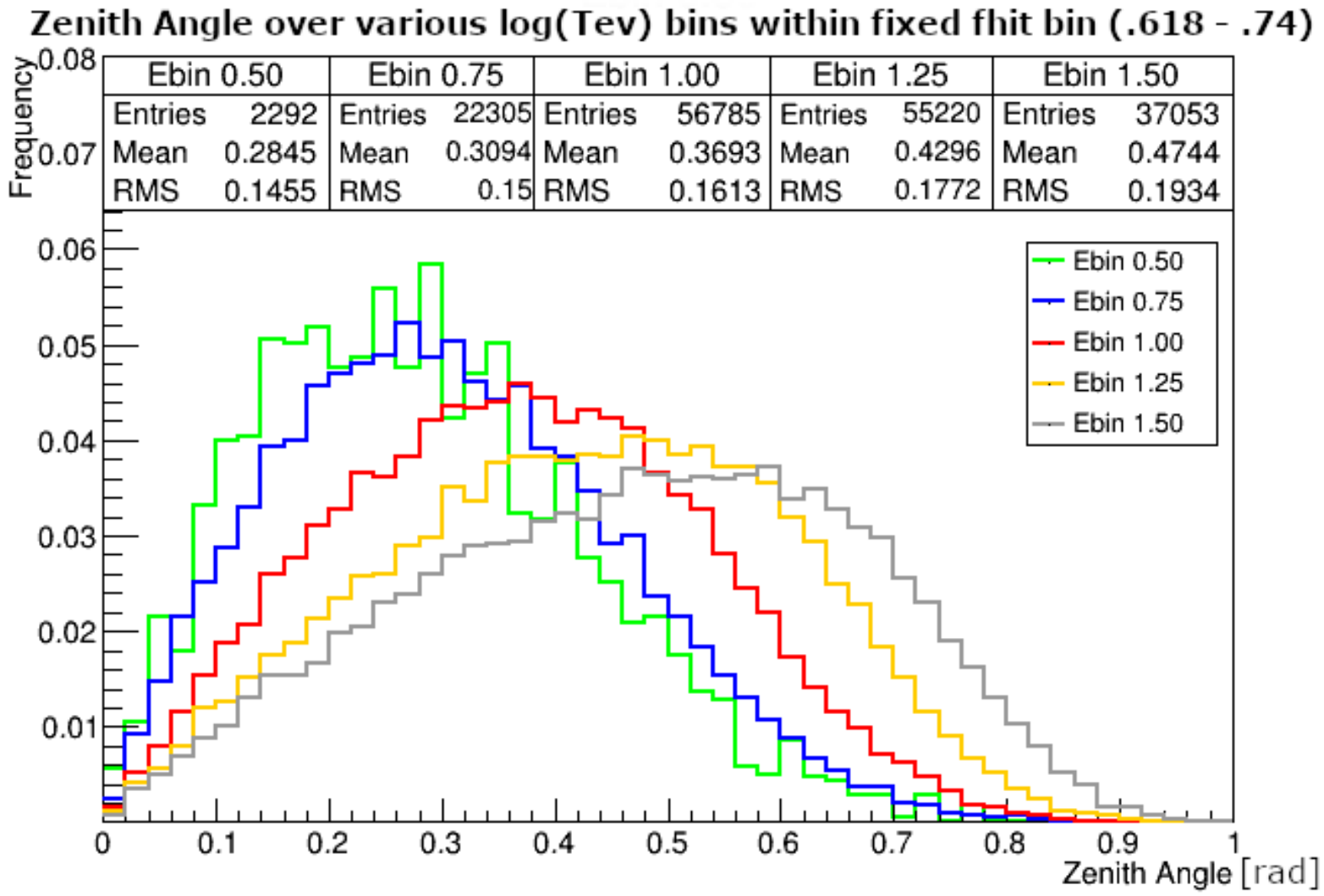
We can see that the highest 2 energy bins look fairly similar, but the graph still varies quite a bit



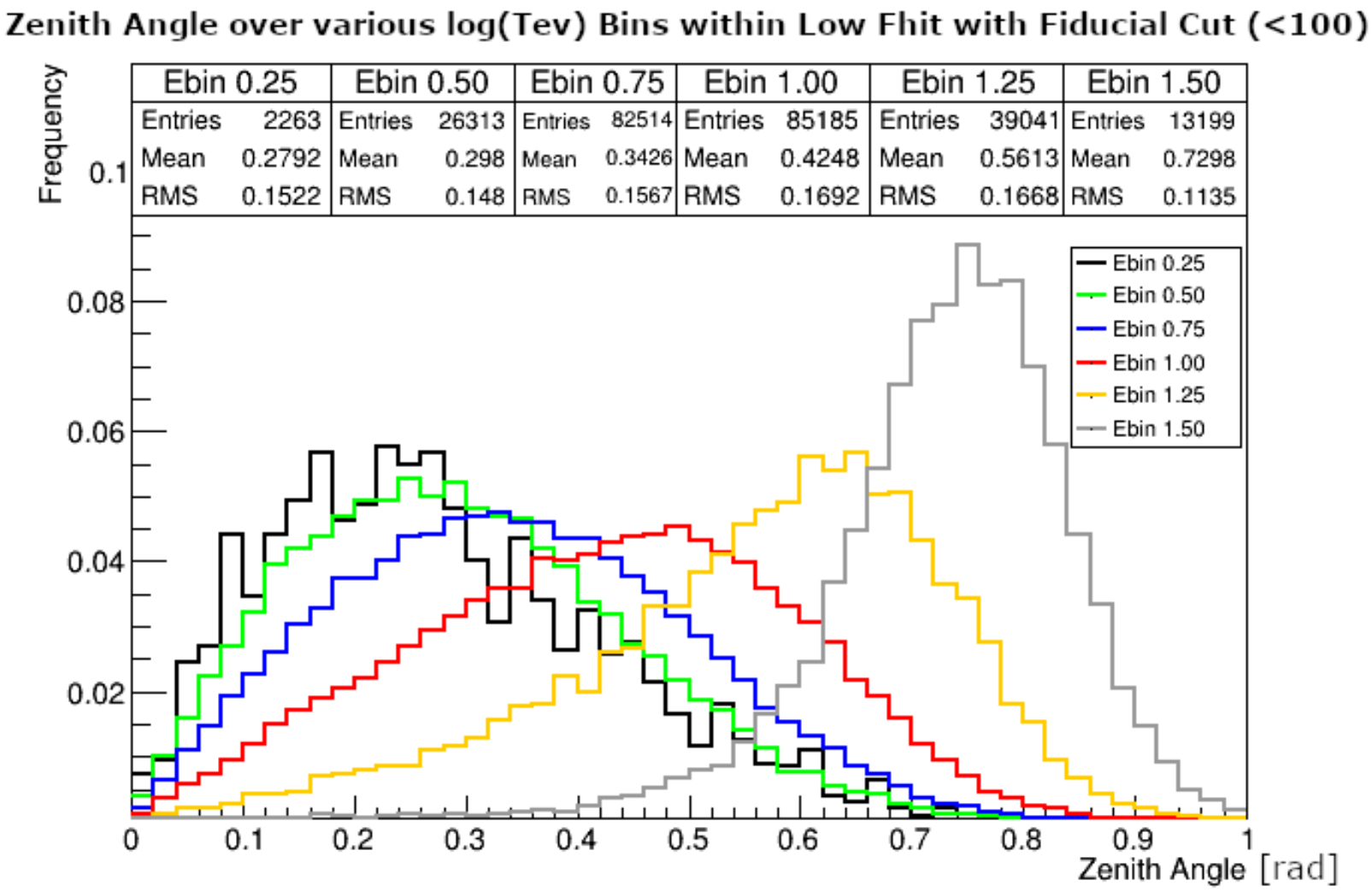
For zenith angle, the different energy bins lie more or less on top of each other, the mean varies roughly linearly with energy



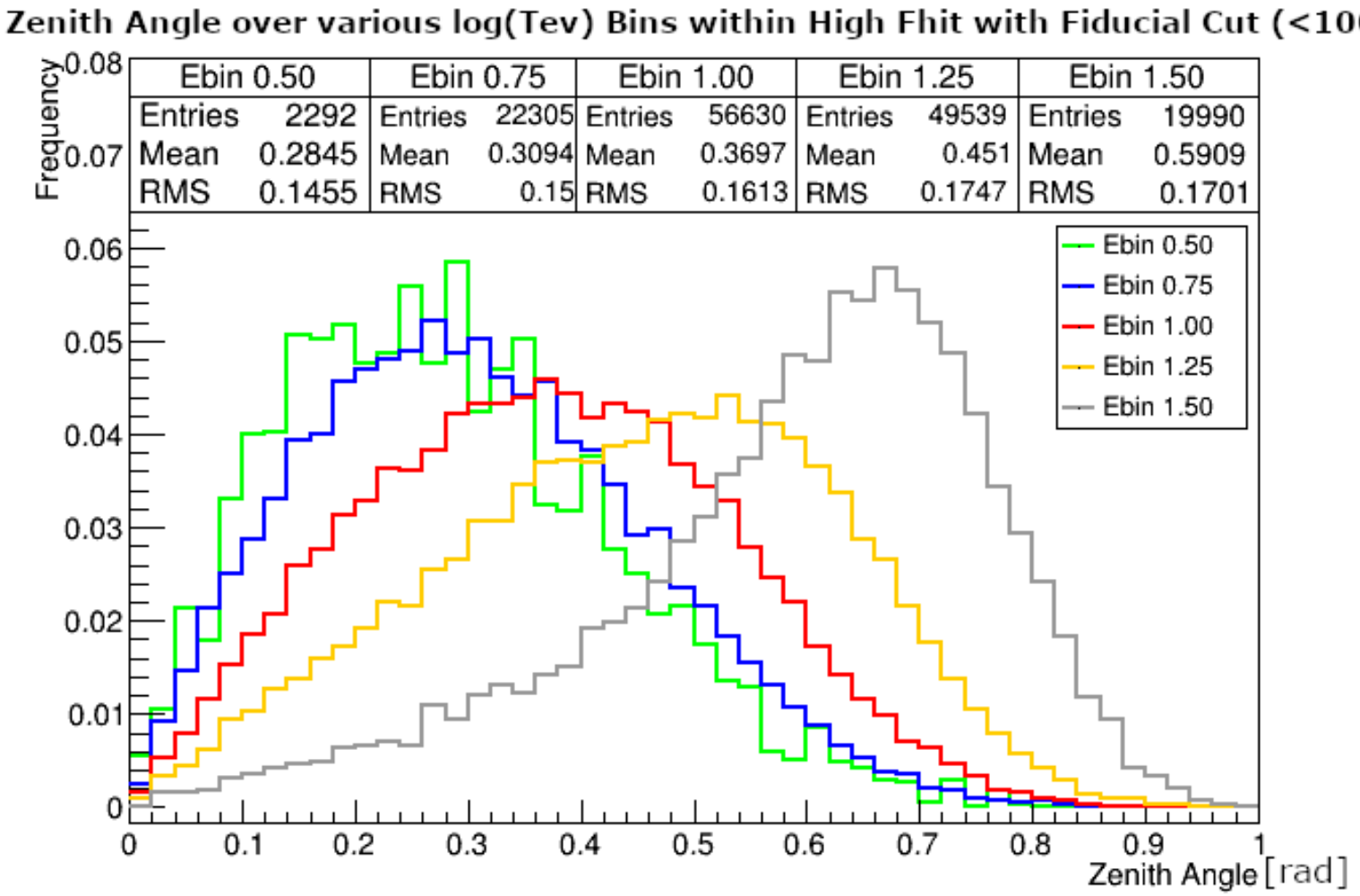
The relative homogeneity of the energy bins indicates that the psf is much more dependent on event centering than zenith angle



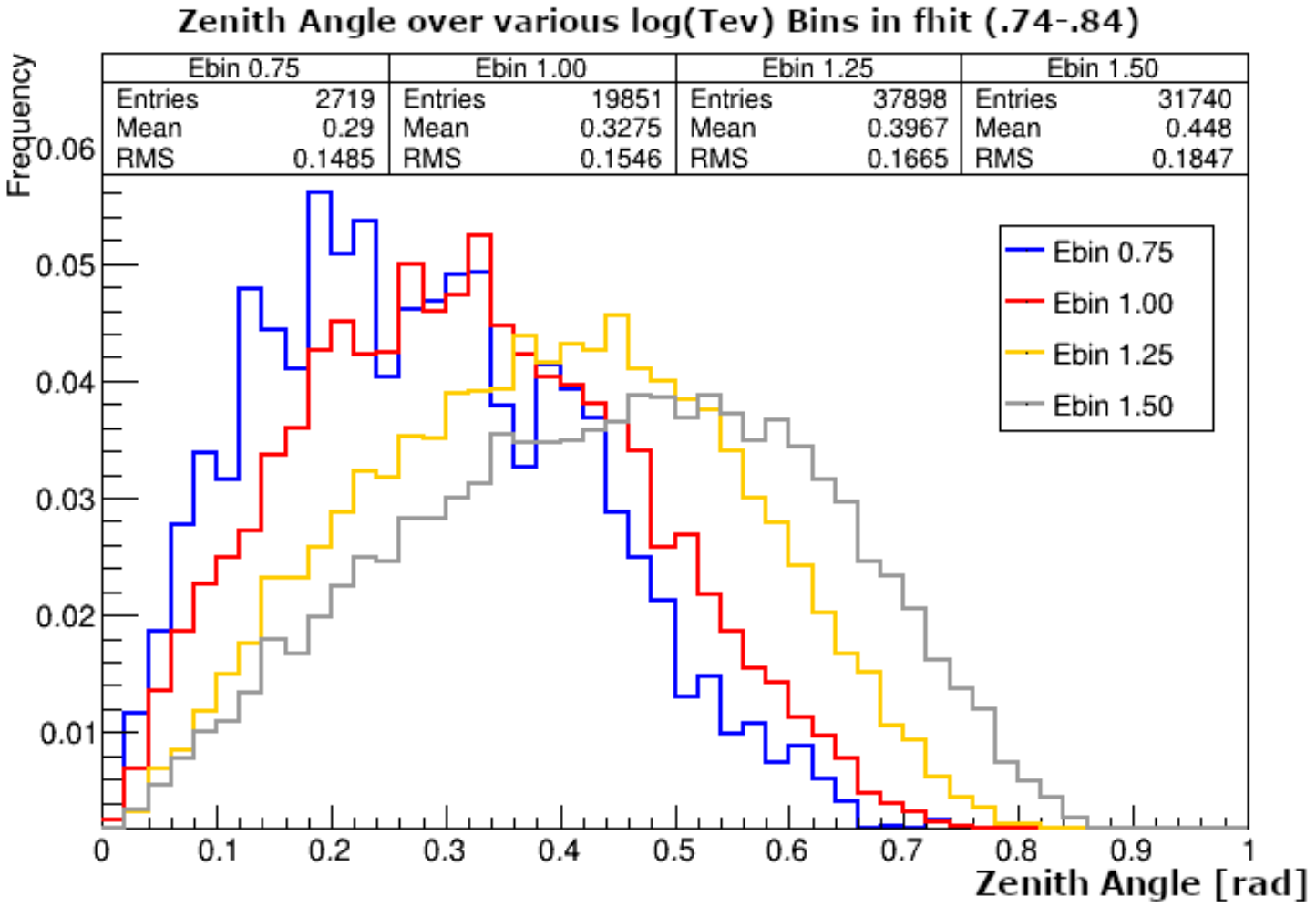
Applying a cut to only include events where the core is contained within the array eliminates most of the lower zenith events from higher E bins and leaves the lower E bins untouched



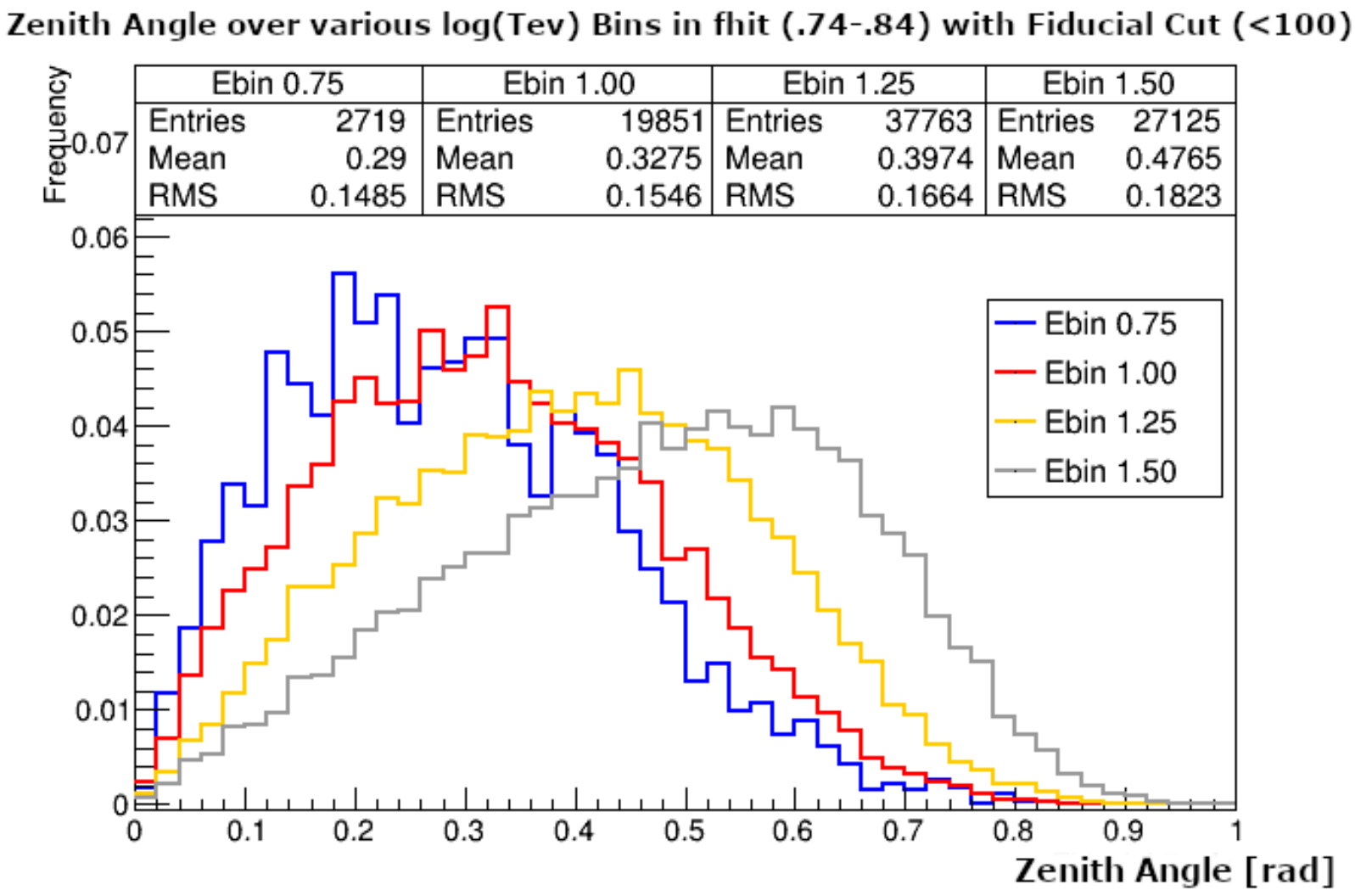
This effect is obviously weakened for higher fhit events; since a higher fhit results in a higher probability of containing the shower core within the array.



For an even higher fhit bin this effect is almost non existent for all but the highest energy bin



As shown, the histogram is hardly affected by the fiducial cut in this Fhit bin



- Made using Gamma MC from:
  - $SCRATCH/systematics/nominal_allspecies/reco_files/gamma.xcd
  - Using SWEETS event weighting