

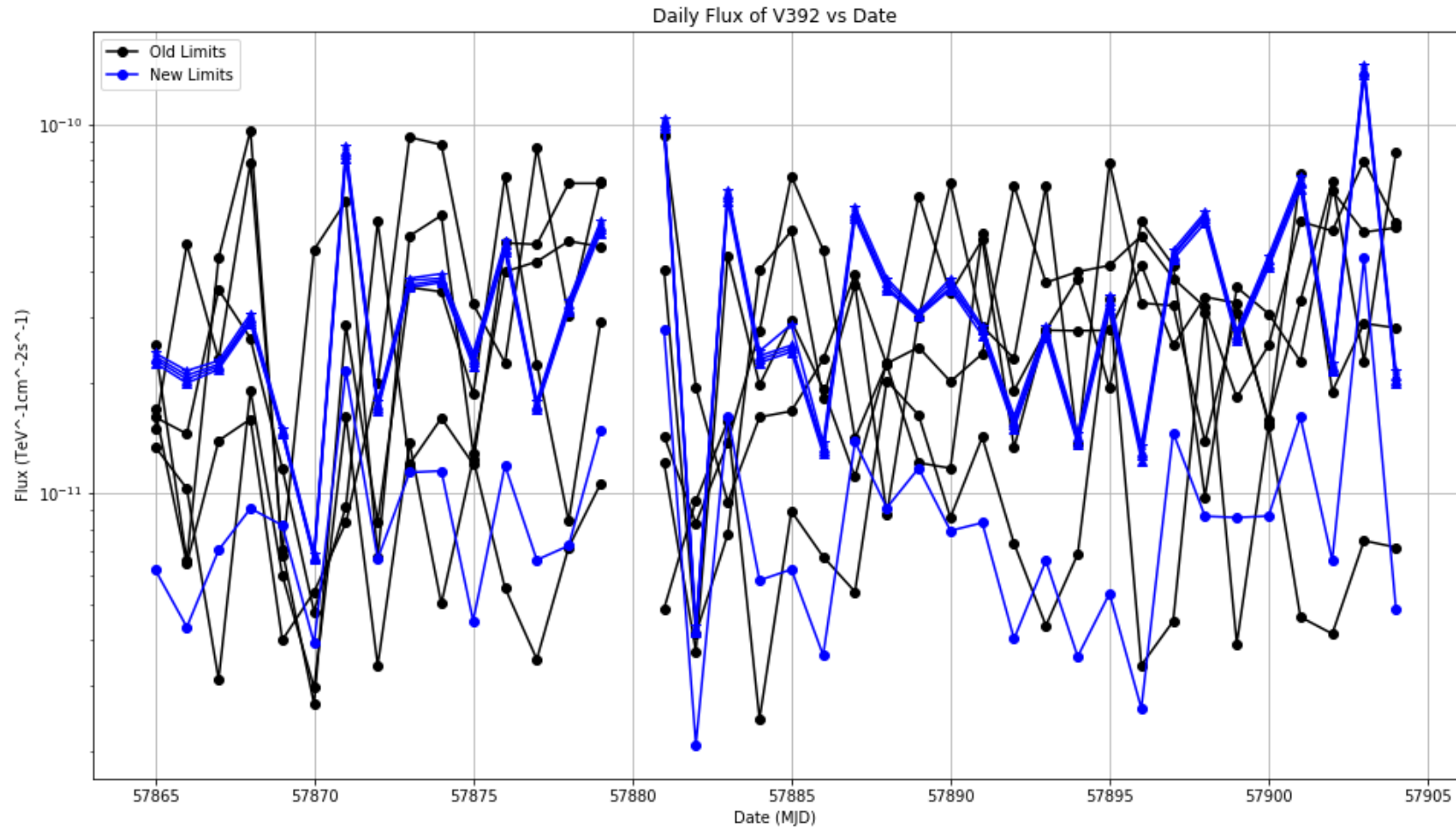
HAWC

Blochwitz 8/15/19

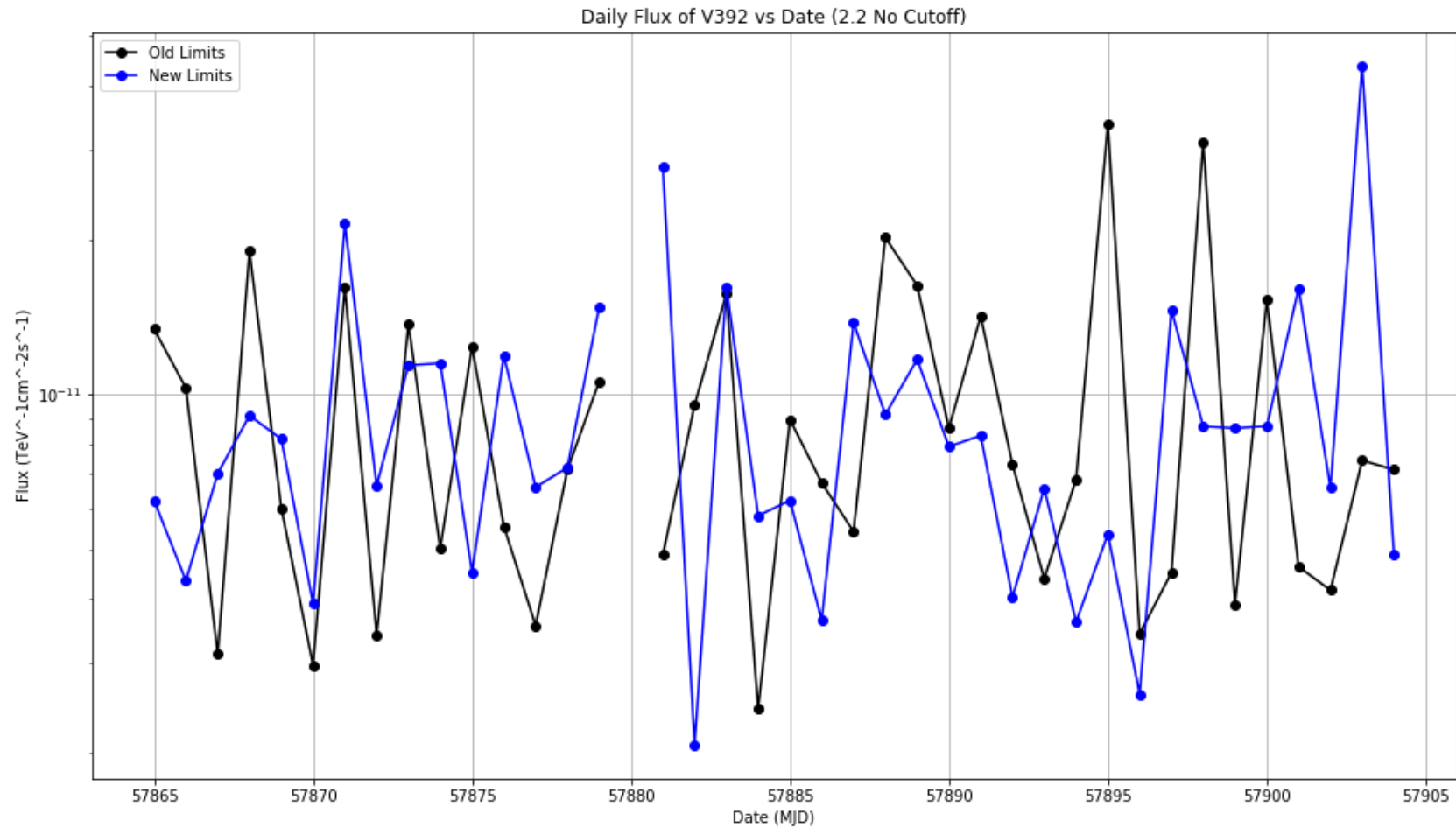
Old Environment vs New Environment

- Last week I made some slides talking about the new environment for computing these limits
- This week I wanted to make a more formal comparison

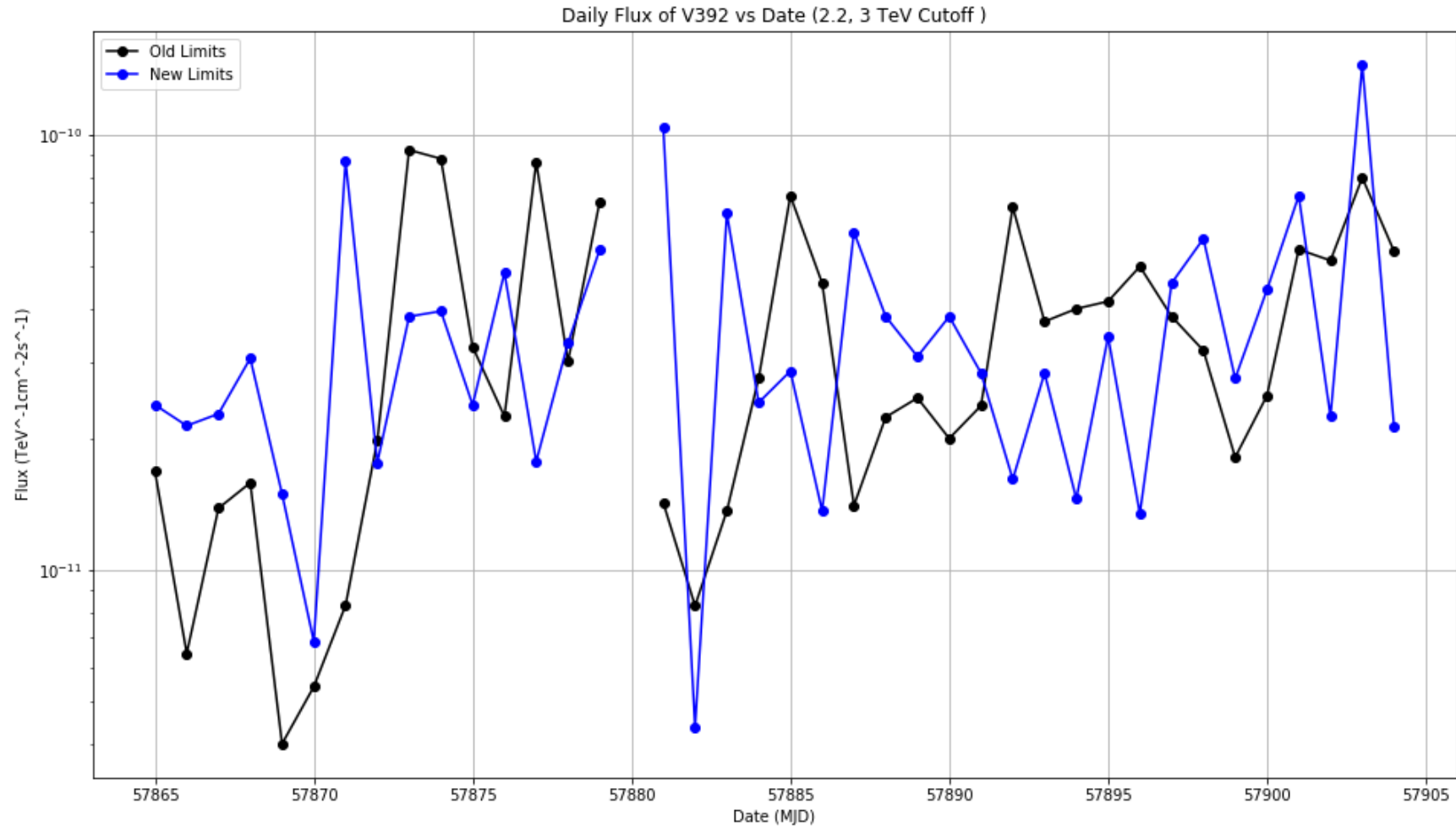
OE vs NE, all plots



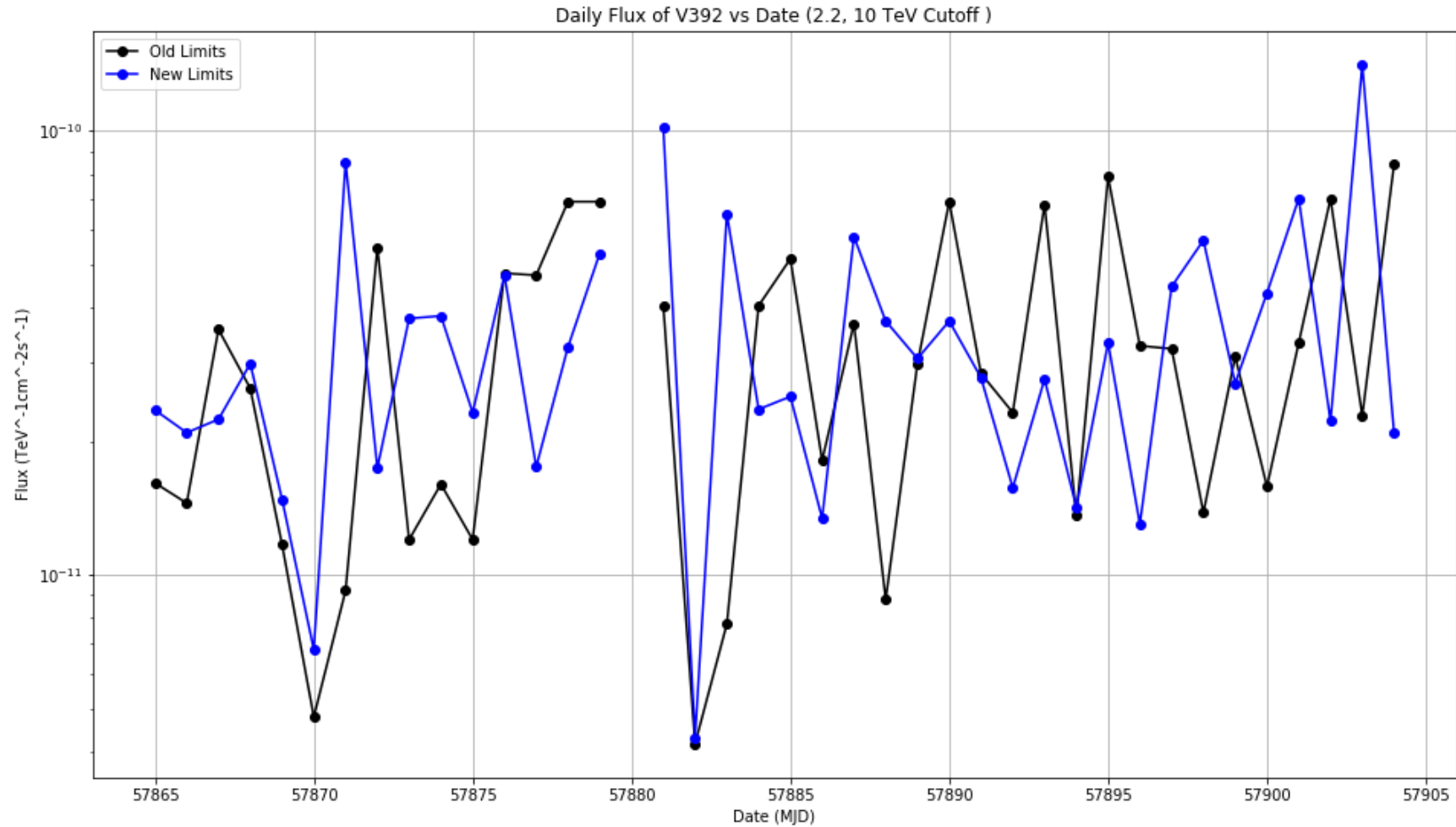
OE vs NE, No Cutoff



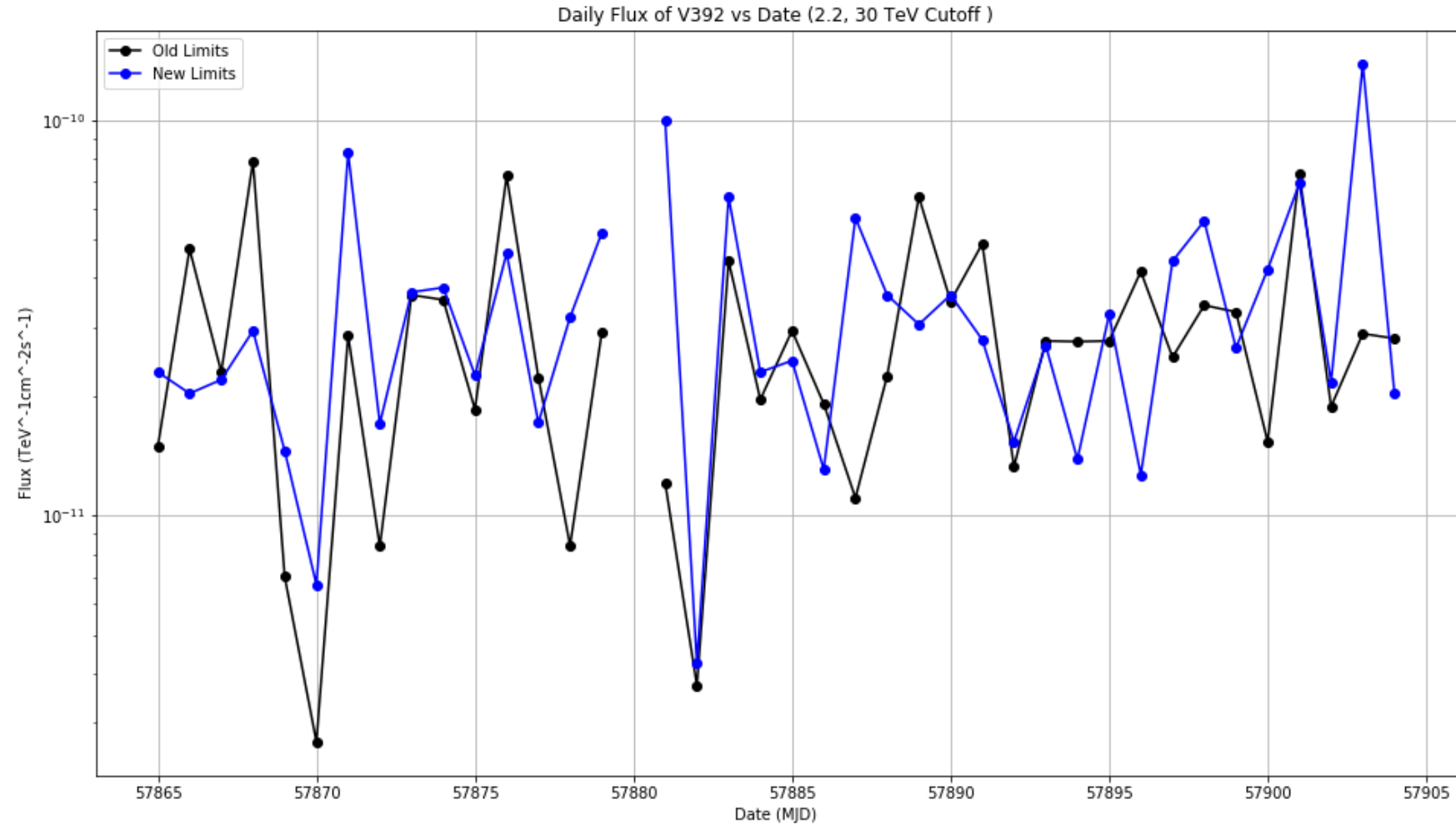
OE vs NE, 3 TeV Cutoff



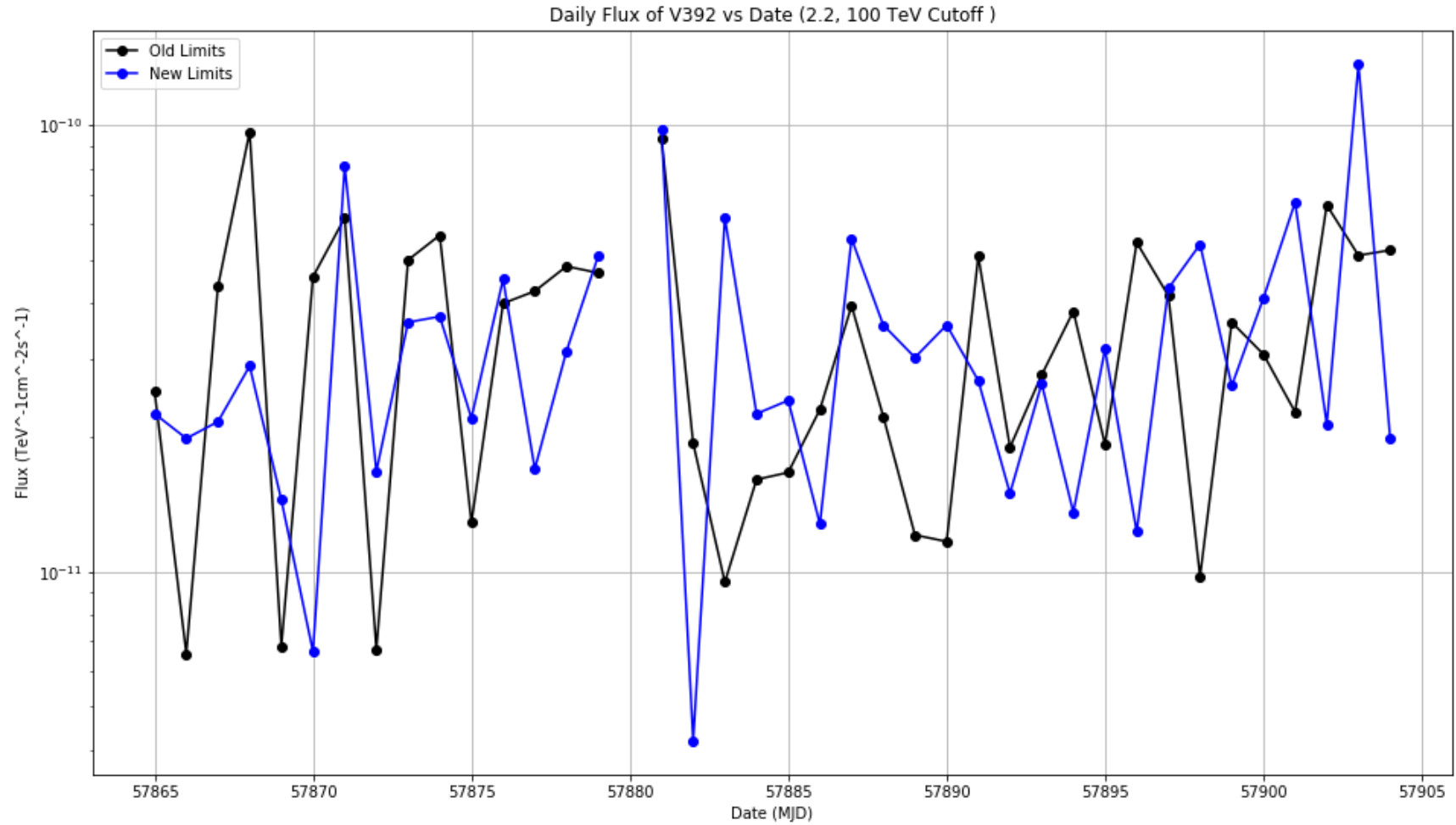
OE vs NE, 10 TeV Cutoff



OE vs NE, 30 TeV Cutoff



OE vs NE, 100 TeV Cutoff



OE vs NE

- The plots are all well and good but are not rigorous
 - Wanted a proper comparison
- Performed a Student's t-test
 - Both a paired and independent test

T-Test Results

Name	Ind. TS	Ind. p-value	Paired TS	Paired p-value
No Cutoff	-0.037303	0.970340	-0.037220	0.970504
3 TeV Cutoff	-0.301277	0.764025	-0.321558	0.749549
10 TeV Cutoff	-0.553162	0.581775	-0.541921	0.591036
30 TeV Cutoff	-1.27927	0.204691	-1.40753	0.167395
100 TeV Cutoff	0.030409	0.975820	0.030409	0.975820

Conclusions

- The two environments don't seem to be particularly different from each other
 - Random chance could explain these behaviors quite well in most cases
 - That seems to be fairly reasonable given the poor behavior of the OE
- NE is at the very least consistent with itself
 - Overall I feel that the NE is the better of the two environments