

Local power-law Crab fit

- Conventional forward folding requires assumption of spectral shape.
- Instead, fit “local” simple power law in a few contiguous bins, and iterate, shifting bins by 1 each time.
- Chose to fit 3 bins at a time. This is tunable.

Step 1: fit power laws for different reco-energy ranges (NN estimator)

Low energy (TeV)	High energy (TeV)	Pivot (TeV)	Norm $[(\text{cm}^2 \text{ s TeV})^{-1}]$	Index
1.0	5.6	2.4	4.41×10^{-12}	-2.30
1.8	10.0	4.2	1.07×10^{-12}	-2.51
3.2	17.8	7.5	2.30×10^{-13}	-2.68
5.6	31.6	13.3	4.46×10^{-14}	-2.89
10.0	56.2	23.7	8.17×10^{-15}	-2.99
17.8	100.0	42.2	1.55×10^{-15}	-2.74

Step 1: fit power laws for different reco-energy ranges (GP estimator)

Low energy (TeV)	High energy (TeV)	Pivot (TeV)	Norm $[(\text{cm}^2 \text{ s TeV})^{-1}]$	Index
1.0	5.6	2.4	4.84×10^{-12}	-2.24
1.8	10.0	4.2	1.22×10^{-12}	-2.68
3.2	17.8	7.5	2.42×10^{-13}	-2.84
5.6	31.6	13.3	4.57×10^{-14}	-2.89
10.0	56.2	23.7	8.15×10^{-15}	-2.94
17.8	100.0	42.2	1.44×10^{-15}	-3.03

Step 2: plot SEDs

- Could plot power laws on reco-energy ranges. But this ignores migration.
- Could plot power laws on, e.g., central 90% of true energies in these bins from MC weighted with fit spectrum.
- Could plot norms at their pivots.

- Will check into SVN along with updates to traditional forward-folding script with proviso about dependency on my 3ML changes.