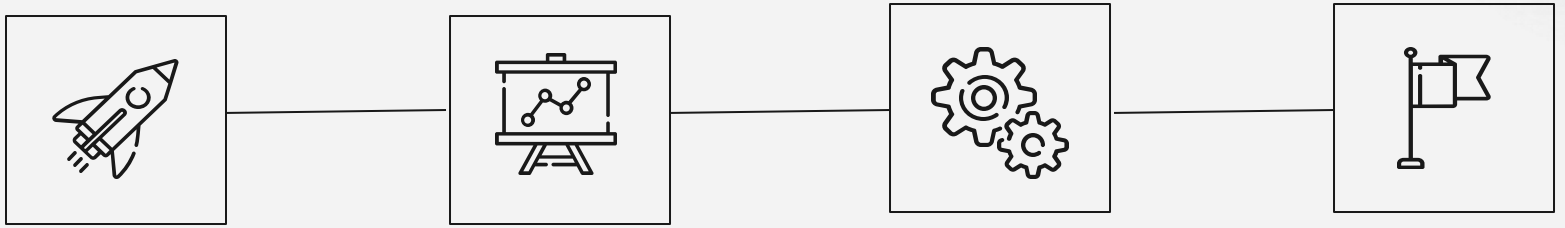
The LIV effect with the Pulsars J2017+0603 and J2215+5135

Lina Breton-Zaourat

Goals



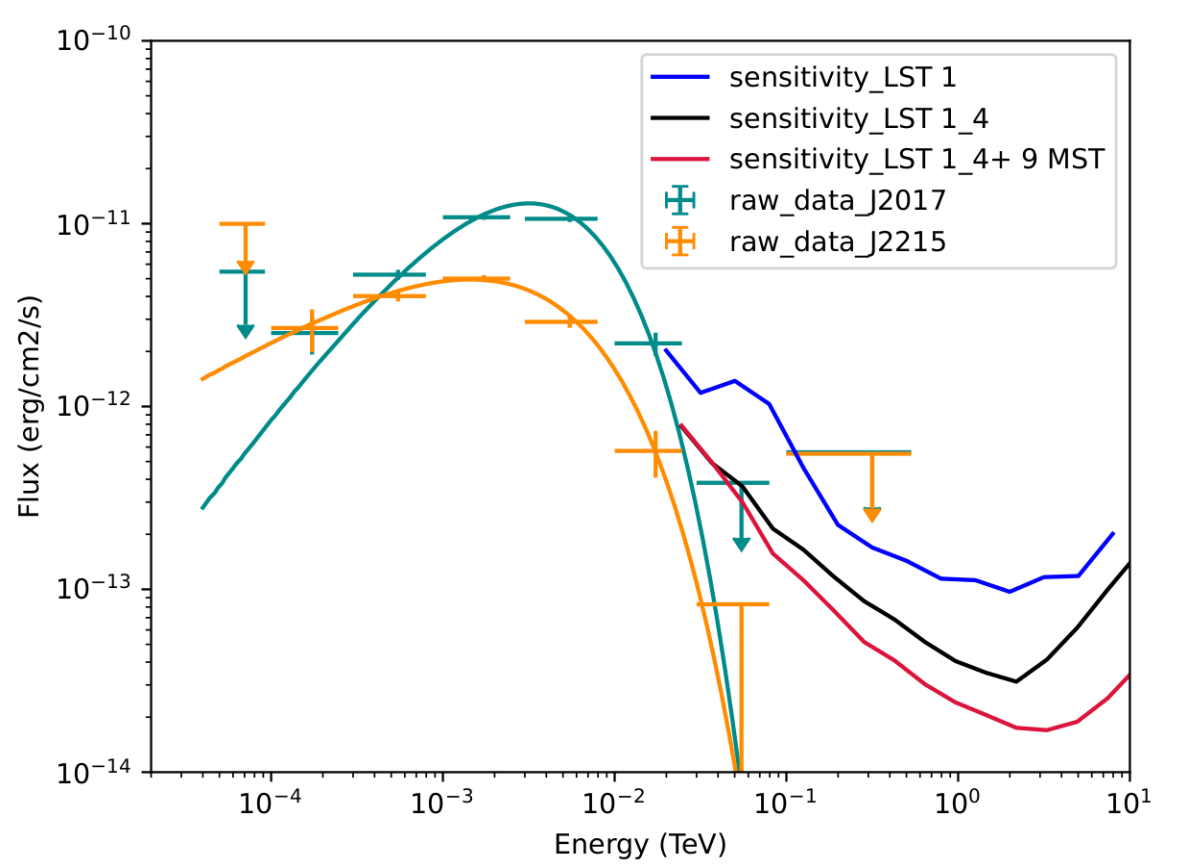
Fermi Data SED Extraction

Fit and extrapolation of SED

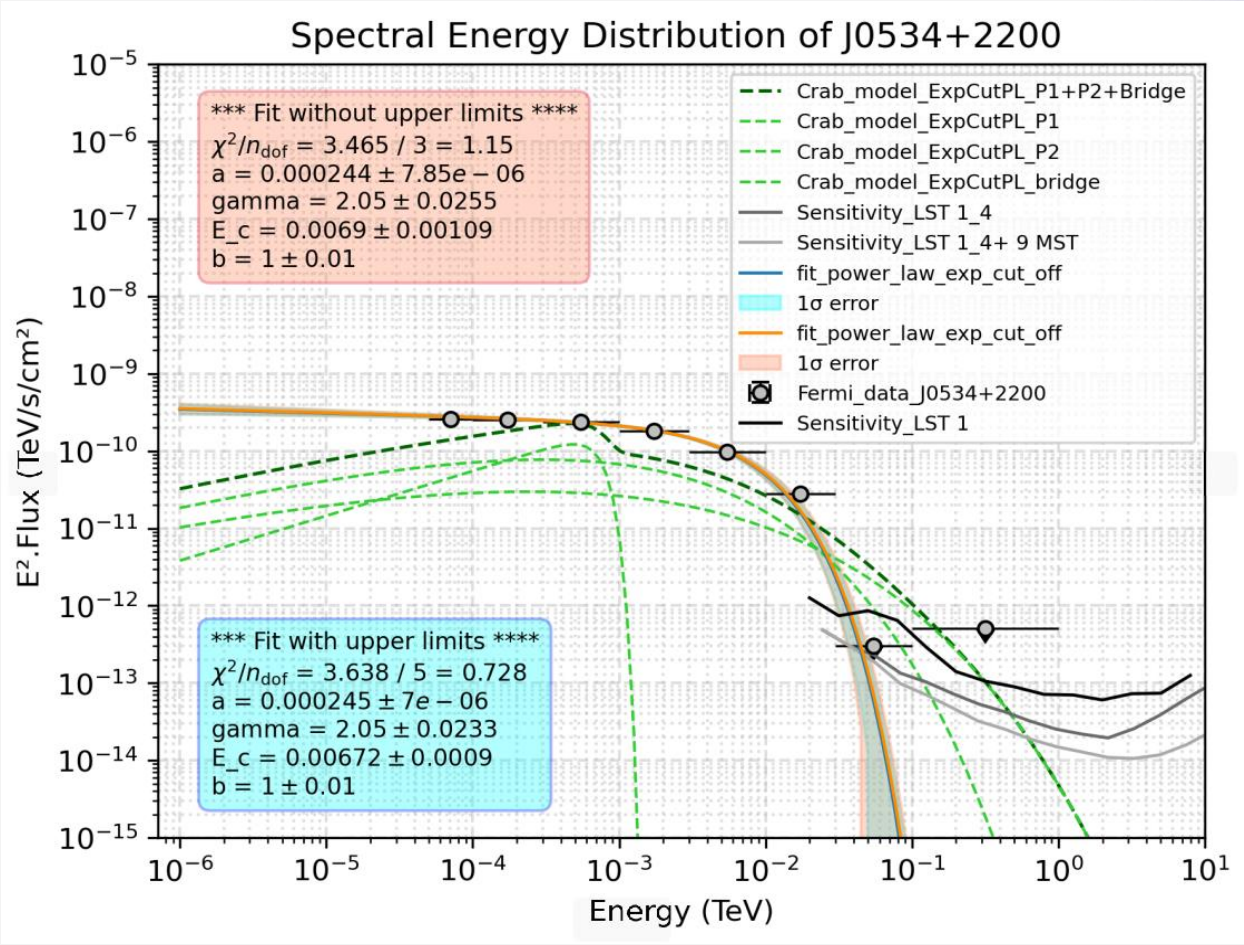
LST Simulation

LIV effect simulation

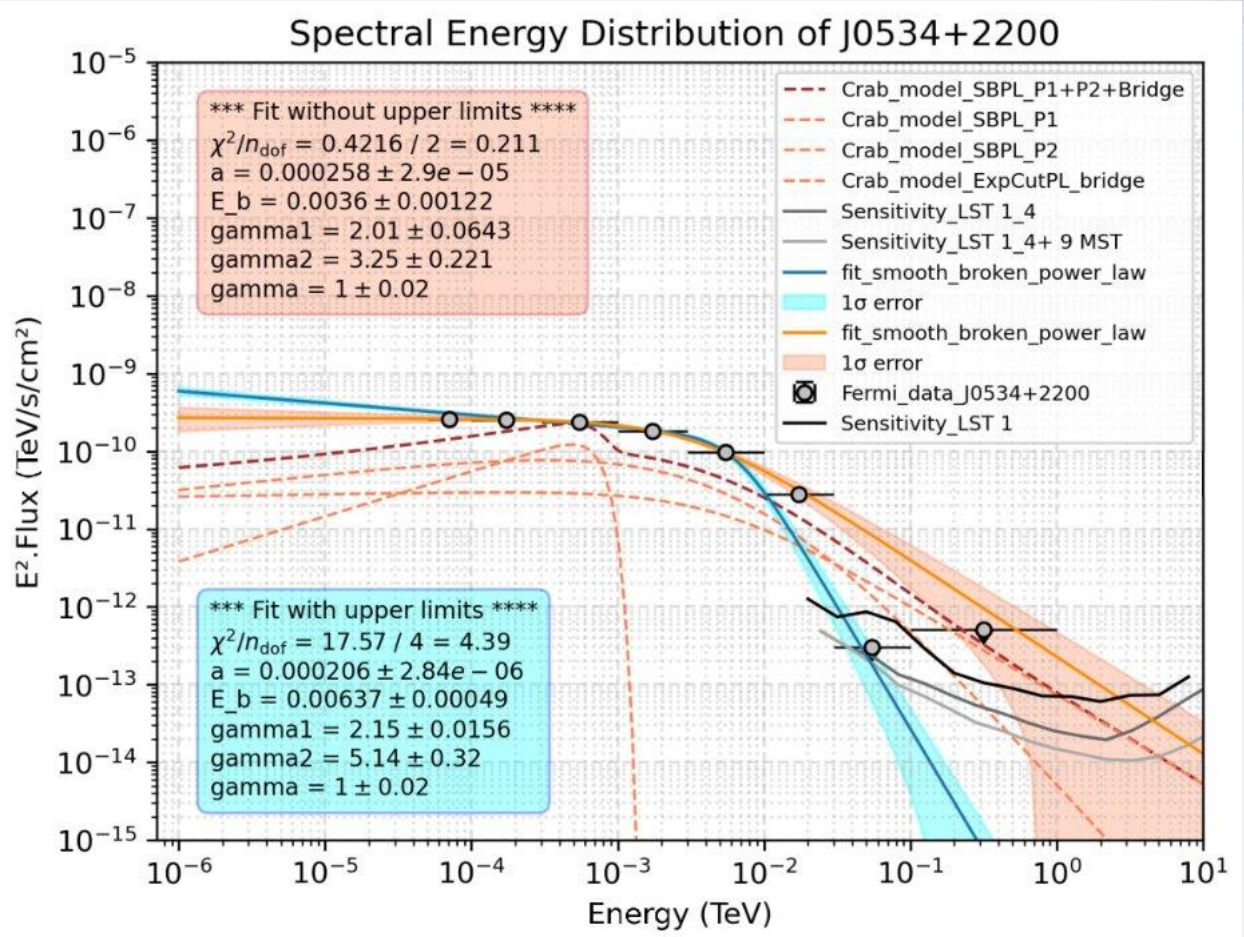
LST sensitivity and Fermi data SED



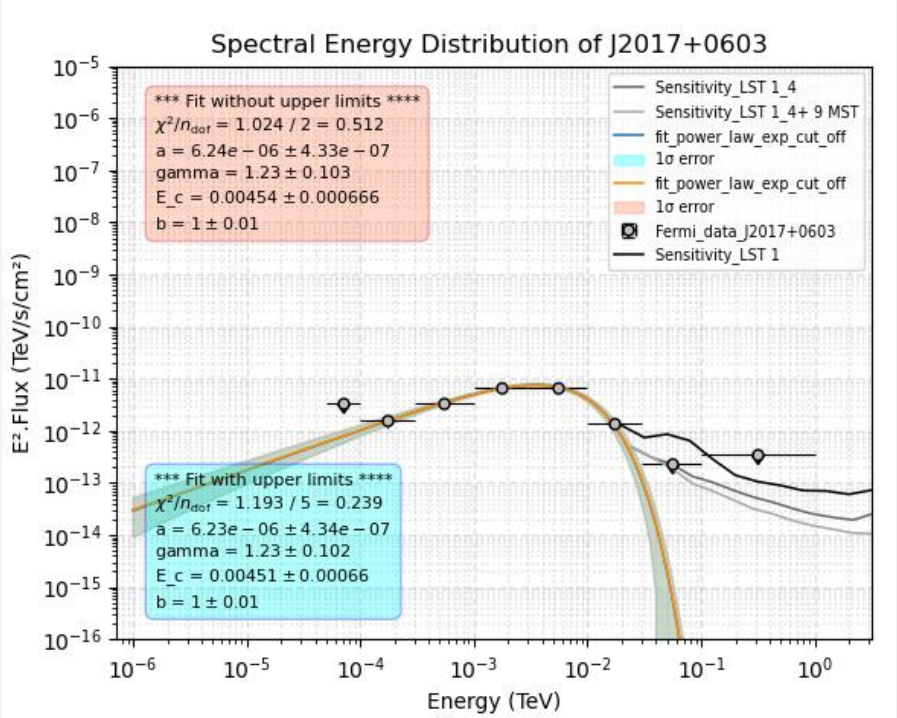
Crab Pulsar SED Fit : Power Law Exp Cut Off model



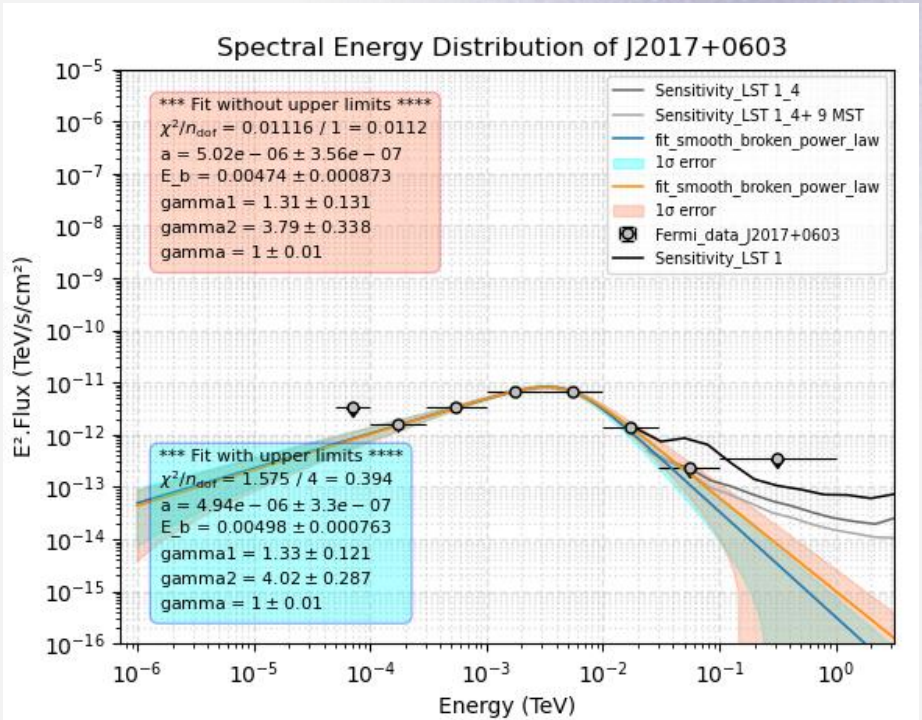
Crab Pulsar SED Fit : Smooth Broken Power Law model



J2017+0603 SED Fits

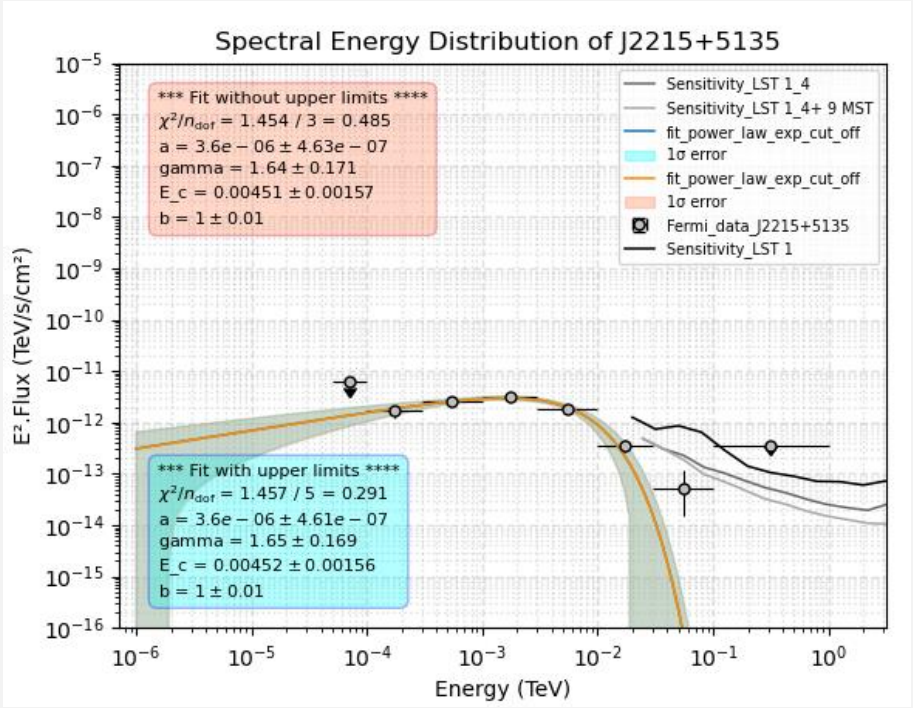


Power Law Exp Cut Off model

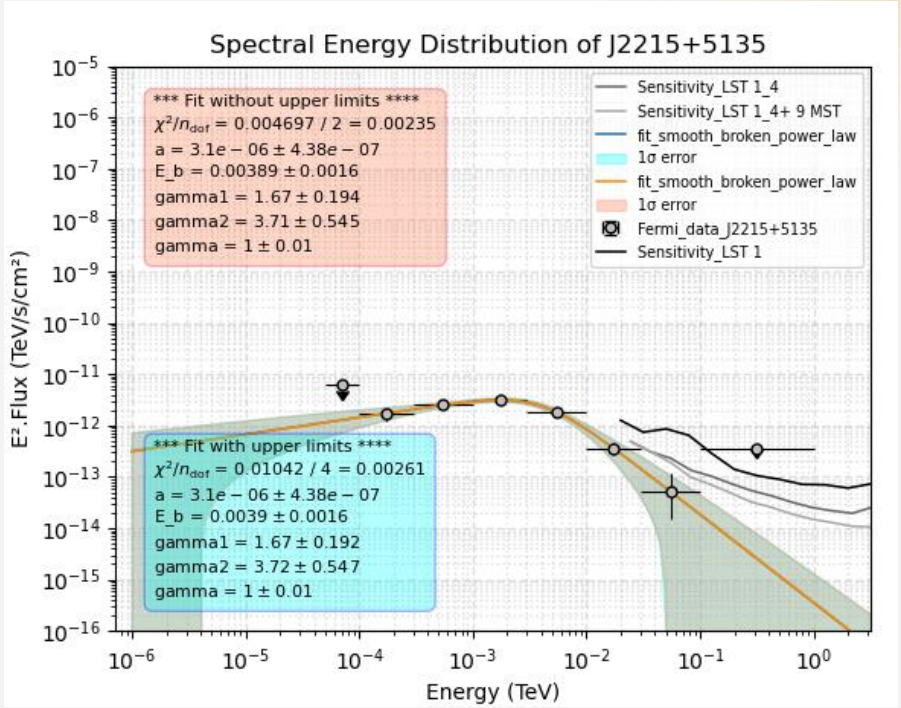


Smooth Broken Power Law model

J2215+5135 SED Fits



Power Law Exp Cut Off model



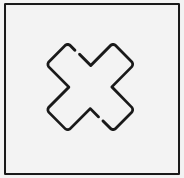
Smooth Broken Power Law model

LST simulation Results

Crab Pulsar

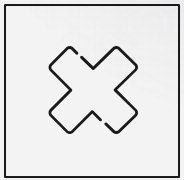
Over detected

J2017+0603



No detection

J2215+5135



No detection

Fitting models

Power Law :

$$\phi \cdot \left(\frac{E_{\text{data}}^{-\gamma+2}}{E_0^{-\gamma}} \right)$$

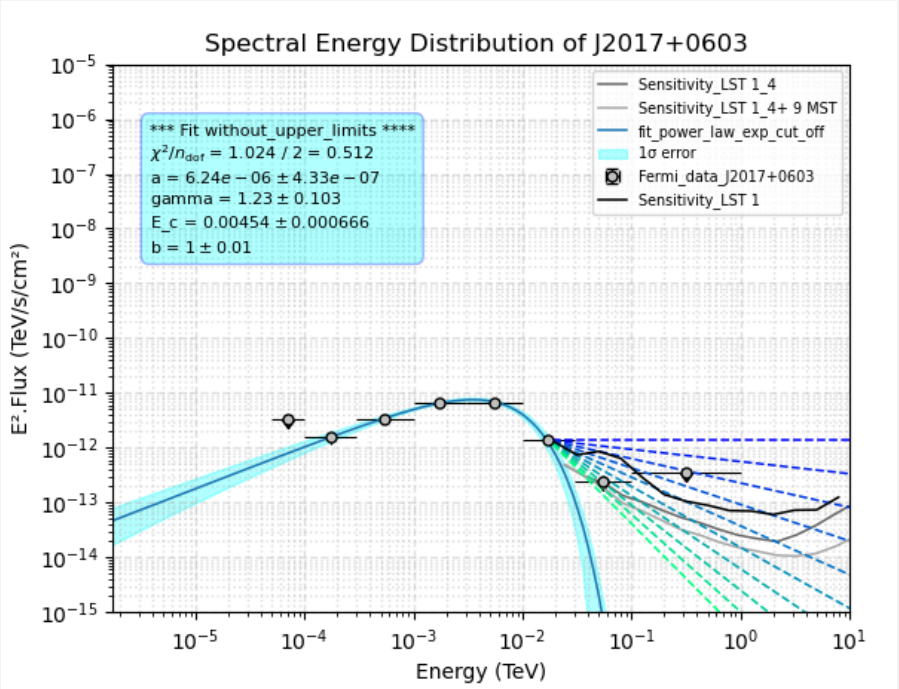
Power Law with exp Cut-Off :

$$\phi \cdot \left(\frac{E_{\text{data}}^{-\gamma+2}}{E_0^{-\gamma}} \right) \cdot \exp\left(- \left(\frac{E_{\text{data}}}{E_c} \right)^b \right)$$

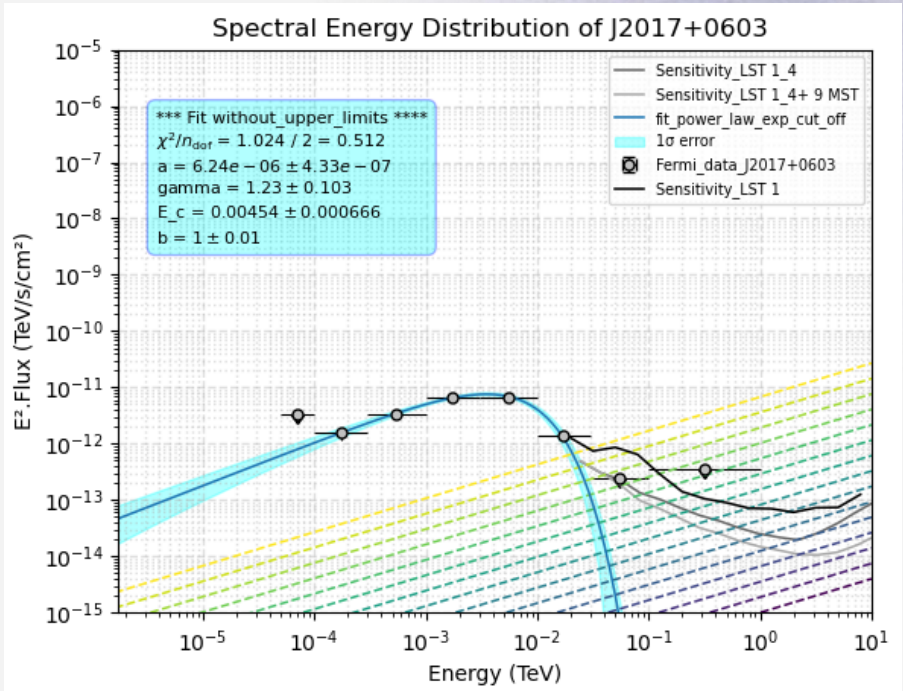
Smooth Broken Power Law :

$$\phi \cdot \frac{E_{\text{data}}^{-\gamma_1+2}}{E_0^{-\gamma_1}} \cdot \left(1 + \left(\frac{E_{\text{data}}}{E_b} \right)^{\frac{\gamma_2-\gamma_1}{\gamma}} \right)^{-\gamma}$$

Other Extrapolation Models



Geminga like model



Vela Like Model