

UHECR from High- and Low-Luminosity GRBs



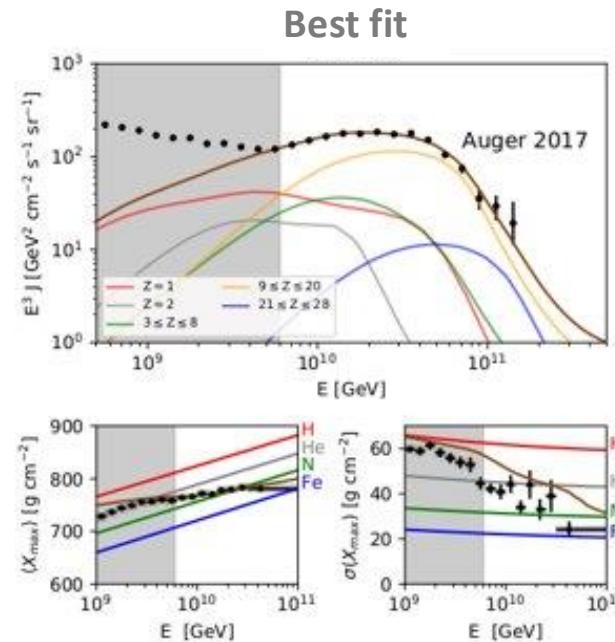
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Can GRBs still be UHECR sources, despite neutrino limits (IceCube)?

Two scenarios within a multi-collision internal shock model:

(1) Fit to UHECR spectrum and $\langle X_{\max} \rangle$: parameter scan over engine realisations

- *Fit parameters:* injection composition & baryonic loading
- *Results:*
 - broad fit range
 - large engine kinetic energy required
 - neutrinos within sensitivity of IceCube Gen2
 - stochasticity of engine /light curve limited by $\sigma(X_{\max})$



(2) LL-GRBs as potential sources of VHE radiation/ UHECR

- *Methods:* Leptonic radiation modeling for prototype GRBs with properties similar to real events. Vary magnetic field via ϵ_B . Calculate maximal cosmic-ray energies
- *Results:*
 - low ϵ_B : high VHE fluxes
 - high ϵ_B : high maximal cosmic-ray energies
 - decoupling of particle production regions (gamma-rays, UHECR)

