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The connection between GRB prompt emission physics and high energy cosmic rays: new constraints using Fermi data

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The acceleration site of ultra-high energy cosmic rays is still an open question despite extended research. Over 20 years ago it was proposed that gamma-ray bursts (GRBs) are good candidates. This idea can now better be tested using recent Fermi data of GRB prompt emission spectra, that can be used to put strong constraints on the physical conditions of the outflow.

I will critically discuss the different emission models in GRBs, in particular the synchrotron and photosphere in view of current observational status. I will then show that the physical conditions during the GRB prompt emission in fact do not enable the acceleration of particles to ultra-high energies, both within the frames of the synchrotron and the photospheric emission models. I will show that this is the case also for low luminosity (ll) GRBs, such as GRB060218.

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