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Synchrotron and Synchrotron-Self-Compton emission components in GRBs detected at Very High Energies

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Gamma-Ray Bursts (GRBs) are energetic transients originating in a violent explosion of a massive star or merger of two compact objects. These explosions create relativistic blastwave whose expansion leads to external shocks. The emission thus produced is the afterglow observed in
GRBs after the prompt emission. The properties of the emitting region i.e. non-thermal
particle spectrum, magnetic amplification, and microphysical parameters, etc can be probed by
monitoring and modelling the afterglow radiation. The recent detection of very high energy (VHE) gamma rays (> 100 GeV) from GRBs has opened a possibility to test theoretical models such as the synchrotron self-Compton (SSC) in GRBs till late times in the afterglow phase. In this work, we study few bright GRBs (Fermi-LAT detected GRB 130427A, MAGIC detected GRB 190114C and HESS detected GRB 180720B) using Synchrotron-Self-Compton model.

I will also discuss how early optical afterglows
and gamma ray giant flares can be useful to reveal the magnetic and baryonic nature of the jet composition in GRBs.

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