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Implications of late-time XRT detected GRBs for particle acceleration

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Relativistic shocks have been widely studied as promising sites for ultra-high-energy particle acceleration. Fruitful predictive results have been obtained from both analytical and numerical methods but require tests from observations. The gamma-ray burst (GRB) afterglows emission are believed to produced when, following relativistic shocks, high-energy electrons are accelerated and then produce multi-wavelength emissions. Thus afterglow observations provide potential information to test our current knowledge on shock acceleration. Here we focus on nine GRBs, selected for having XRT afterglow detection at ˜ 10ˆ7 seconds after the GRB trigger time with determined redshifts. Specifically we explore the constraints on acceleration models set by the maximum electron energy required by the observational data from these events.

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