

Search for 10-1,000 GeV neutrinos from GRBs, including the very bright GRB 221009A

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We searched for 10-1,000 GeV neutrinos from 2,268 gamma-ray bursts of IceCube-DeepCore data collected between April 2012, and May 2020. We have also conducted the same search for the “brightest of all time” (BOAT) GRB 221009A. We find no evidence of neutrino emission from these GRBs. We present model-independent limits on neutrino emission from these GRBs for various time scales that overlap with prompt, precursor and early afterglow phases. If the fireball is baryon loaded, this leads to subphotospheric neutron-proton collisions. We find that GRB 221009A provides the most constraining limit on the baryon loading. Assuming a jet Lorentz factor of 300 (800), the baryon loading on GRB 221009A is lower than 3.85 (2.13) at a 90% confidence level. The canonical value of baryon loading in models is 5.

Poster prize

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