

High energy neutrinos from gamma-ray bursts

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Due to their non-thermal nature, gamma-ray bursts (GRBs) are promising sources of high energy neutrinos. After the years of the GRB triggered search, IceCube Collaboration has put strict upper limits on the neutrino flux. We propose new weighting technique for the neutrino search considering multi-GRB stacking analysis. We invoke known GRB spectral-energy correlations to reduce the amount of unknown and model-dependent GRB parameters. With this approach we perform stacking triggered GRB neutrino search with the open access IceCube data. Despite the prompt emission, we show that the late time X-ray transients associated with GRBs could be promising sources of TeV neutrinos. As a result of our analysis, we put constrains on the amount of protons in the GRB jets and draw prospects for the high energy neutrino detectability with the next generation IceCube-2 detector and upcoming gamma- and X-ray telescopes.

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