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Neutrinos from Gamma-ray Burst Revisited

Gamma-ray bursts (GRB) were proposed as a leading candidate for the high energy cosmic ray source and therefore, neutrinos. However, the null result from the recent search with GRBs by IceCube had challenged this scenario. Here we revisit both the conventional fireball shock model and new GRB models, such as a dissipative photospheric model, baryonic or magnetic models, with a more refined calculation. The result shows that the current non-detection of GRB neutrinos is in fact not surprising. With ten years of operation by IceCube and new experiments covering a even broader energy band, the high energy neutrinos should be able to tell us the correct GRB model from above, or rule all of them out.

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