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Correspondence of gamma radiation coming from GRBs and magnetars based on the effects of nonlinear vacuum electrodynamics

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ABSTRACT

It appears that studying the data from the catalogue of Gamma-Ray Bursts (GRBs) can be used to study the birefringence phenomenon in the magnetosphere of the magnetars. By analysing the data from the McGill Online Magnetar and HEASARC Fermi Burst Catalogues, in this work we studied the angular distances between the nearest GRBs and magnetars in projection, built their distribution map as detected by 2020, and the relative lag time periods of lights coming from GRBs and magnetars. It is confirmed that there are 29 galactic magnetars and their candidates, while the other two are located out of the Milkyway. The maximum separation angle for GRB and Magnetar projectiles was 3.76 degrees (4U0142+61 and GRB110818860), while minimum angular resolution was 0.54 degrees (SGR 1627-41 and GRB090829672). Currently, we discuss the relationship of GRB light intensity by their lag time as it would come after bending by the magnetosphere.

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