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Theoretical Modelling of Gamma-Ray Burst 090510

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Gamma-ray bursts observed in high energies allow the investigation of the emission processes of these still puzzling events. Here, we investigate the peculiar GRB 090510, a short GRB with an indication of plateau emission observed by the Fermi-LAT within the context of general relativistic magnetohydrodynamic code (HARM) to infer the jet opening angle, the energetics, the Lorentz Gamma factor, the structure and variability of the jet, and the progenitor parameters of the compact binary. We tested the 2D and 3D models and estimated the time scale of variability. The predicted energetics and the jet opening angle are in general agreement with observed values when we consider that the jet opening angles also evolve with redshift. This work establishes a basis for ongoing exploration, which will further align the theoretical model simulations with observations.

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