# Prior Emission Model for X-ray Plateau Phase of Gamma-Ray Burst Afterglows

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Abstract

The two-component emission model to explain the plateau phase of the X-ray afterglows of gamma-ray bursts (GRBs) is proposed. One component, which is responsible for the plateau and subsequent normal decay phase of the X-ray afterglow, is the prior emission via outflow ejected from the central engine before the main burst. The other is the main outflow, which causes the prompt GRB emission and the initial steep decay phase of the X-ray afterglow. In this model, the transition from the plateau to the subsequent normal decay phase is an artifact of the choice of the zero of time. For events with distinct plateau phase, the central engine is active $10^3 - 10^4$ sec before the launch of the main outflow. According to this model, a prior emission in the X-ray and/or optical bands $10^3 - 10^4$ sec before the prompt GRB emission is possibly seen, which will be tested by MAXI.