

Constraining GRB Emission Physics with Extensive Early-Time, Multiband Follow-up

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Understanding the origin and diversity of emission processes responsible for Gamma-ray Bursts (GRBs) remains a pressing challenge. While prompt and contemporaneous panchromatic observations have the potential to test predictions of the internal-external shock model, extensive multiband imaging has been conducted for only a few GRBs. We present rich, early-time, multiband datasets for two \swift\ events, GRB 110205A and GRB 110213A. The former shows optical emission since the early stages of the prompt phase, followed by the steep rising in flux up to ~ 1000 s after the burst (α with $\alpha = -6.13 \pm 0.75$). We discuss this feature in the context of the reverse-shock scenario and interpret the following single power-law decay as being forward-shock dominated. Polarization measurements, obtained with the RINGO2 instrument mounted on the Liverpool Telescope, also provide hints on the nature of the emitting ejecta. The latter event, instead, displays a very peculiar optical to near-infrared lightcurve, with two achromatic peaks. In this case, while the first peak is probably due to the onset of the afterglow, we interpret the second peak to be produced by newly injected material, signifying a late-time activity of the central engine.

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