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Time-Domain Astrophysics with ALMA: GRB 161219B, Unexpected Variability, and the First ALMA Afterglow Light Curve

Long understood to be powered by synchrotron radiation from relativistic shocks, Gamma-ray burst afterglows were expected to exhibit smooth, connected power law spectra from the radio through the x-ray. Our new observations with the Jansky VLA have challenged this notion by uncovering multiple radio components and indicate unusual physics at play, either intrinsic to the explosion or along the line of sight to the source. I present the combined power of VLA and ALMA unleashed upon a bright GRB from December 2016, which reveal rapid variability and unusual spectral transitions. Our observations push ALMA to its limits in Target-of-opportunity studies, and highlight the critical role of joint mm-cm observations in the astrophysics of radio transients.